Nakamichi

Service Manual

Nakamichi NR-200

Dolby B-C Type Noise Reduction System

NR-200

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1. GENERAL

1.1. Control Functions

The Nakamichi NR-200 control functions are shown below:

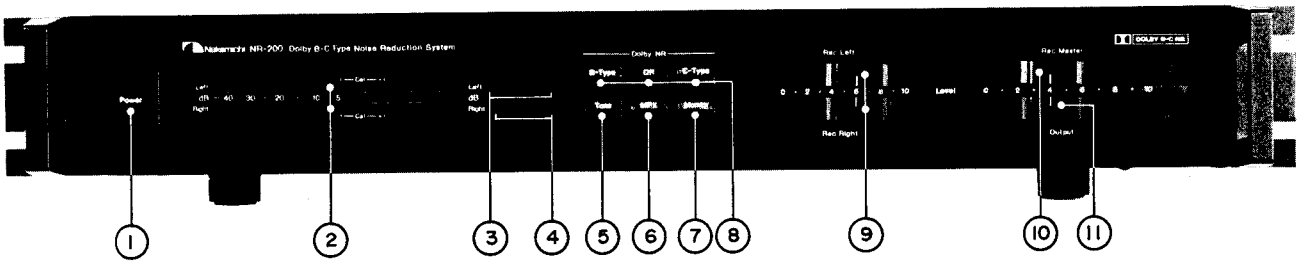

Fig. 1.1 Front View

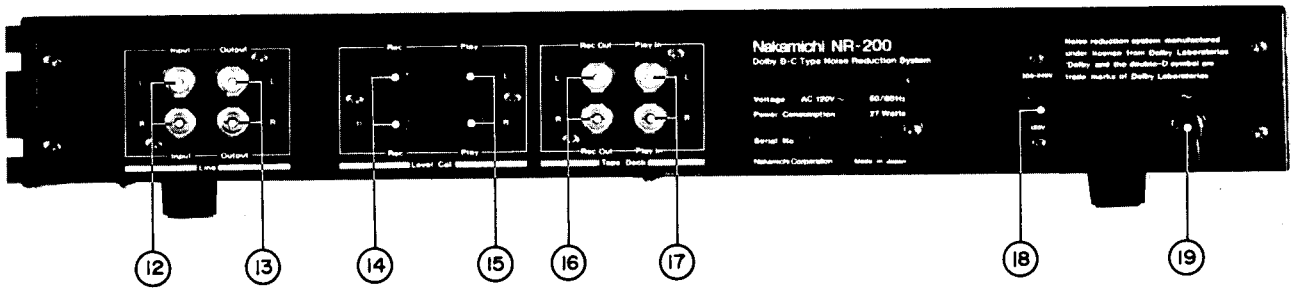

Fig. 1.2 Rear View

1. Power Switch
2. Peak Level Meters
3. Noise Reduction Indicator
4. Monitor Indicator
5. Tone Switch
6. MPX Filter Switch
7. Monitor Switch
8. Dolby NR Switches
9. Record Level Controls
10. Master Level Control
11. Output Level Control
12. Line Input Jacks
13. Line Output Jacks
14. Calibration Controls (Record)
15. Calibration Controls (Play)
16. Record Out Jacks
17. Play In Jacks
18. Voltage Selector Switch
19. Power Cord

1.2. Voltage Selector

Voltage selector is installed on the rear panel for Other Version of the Nakamichi NR-200.
This voltage selector can select either 120 V or 220-240 V at customer's disposal.

1.3. Attention to Servicemen

Before returning the repaired NR-200 to a customer, check to insure that the exposed part is accurately insulated from the AC line by measuring the leakage current or the insulation resistance between them.

2. REMOVAL PROCEDURES

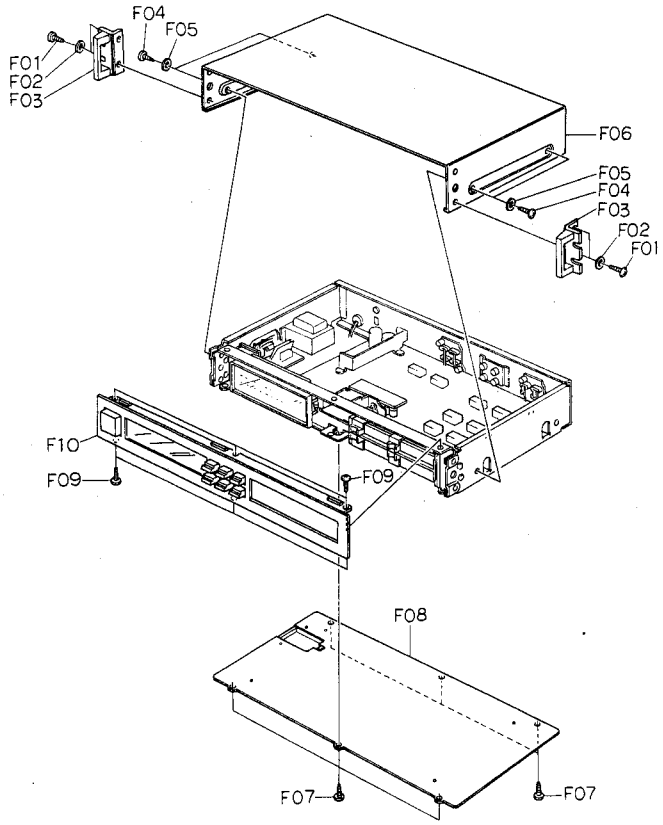

Fig. 2.1

2.1. Side Plates

Refer to Fig. 2.1.

(1) Remove F01 and F02, then disassemble F03 (Side Plate).

2.2. Top Cover Ass'y

Refer to Fig. 2.1.

(1) Remove Side Plates referring to item 2.1.

(2) Remove F04 and F05, then disassemble F06 (Top Cover Ass'y).

2.3. Bottom Cover Ass'y

Refer to Fig. 2.1.

(1) Remove F07, then disassemble F08 (Bottom Cover Ass'y).

2.4. Front Panel Ass'y

Refer to Fig. 2.1.

(1) Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 2.2 and 2.3.

(2) Remove F09, then disassemble F10 (Front Panel Ass'y).

2.5. Front Chassis Ass'y, Volume P.C.B. Ass'y, Indicator Ass'y and Lamp P.C.B. Ass'y

Refer to Fig. 2.2.

(1) Refer to Fig. 2.1. Remove Front Panel Ass'y referring to item 2.4.

(2) Remove F01 and F02, then disassemble F03 (Front Chassis Ass'y).

(3) Remove F04, then disassemble F05 (Slide Volume Ass'y).

(4) Remove F06, then disassemble F07 (Volume Knob Ass'y).

(5) Remove F08, then disassemble F09 (Volume Holder) and F10 (Volume P.C.B. Ass'y).

(6) Remove F11, then disassemble F12 (Indicator Ass'y).

(7) Remove F13, then disassemble F14 (Indicator Cover).

(8) Remove F15, then disassemble F16 (Indicator P.C.B Ass'y) and F17 (Indicator Holder).

(9) Remove F18, then disassemble F19 (Lamp P.C.B. Ass'y).

2.6. Main P.C.B. Ass'y and Dolby NR Switch P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.1. Remove Front Panel Ass'y referring to item 2.4.

(2) Pull out F01 (Volume Knob). Remove F02, then disassemble F03 (Calibration Volume Ass'y).

(3) Remove F04, F05, F07 and F08, then disassemble F06 (Volume) and F09 (Volume).

(4) Remove F10, F11 and F12, then disassemble F13.

(5) Remove F14, then disassemble F15 (Dolby NR Switch P.C.B. Ass'y) and F16 (Main P.C.B. Ass'y).

2.7. Power Transformer and Fuse P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y referring to item 2.2.

(2) Remove F17 and F18, then disassemble F19 (Power Transformer).

(3) Remove F20, then disassemble F21 (Insulator) and F22 (Fuse P.C.B. Ass'y).

2.8. Power Switch

Refer to Fig. 2.3.

(1) Refer to Fig. 2.1. Remove Front Panel Ass'y referring to item 2.4.

(2) Remove F23, then disassemble F24 (Power Switch).

2.9. Rear Panel Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 2.2 and 2.3.

(2) Remove F25, then disassemble F26 (Rear Panel Ass'y).

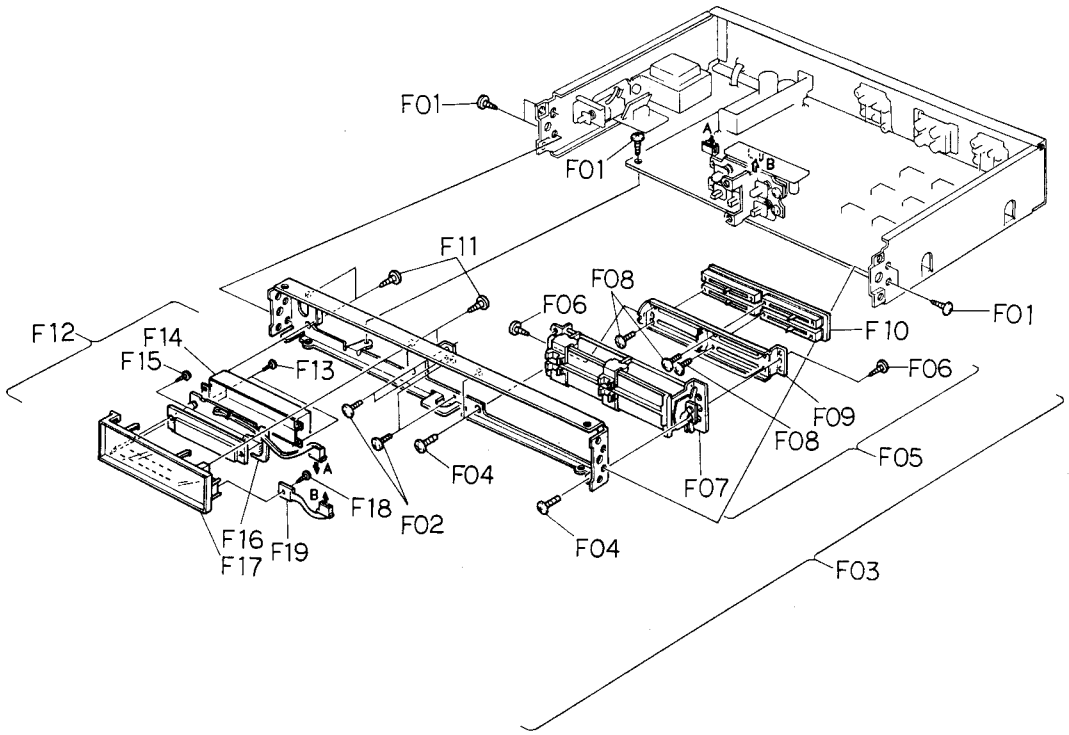
F01
F01
F11
F08
F06
F01
F10
F12
F14
F15
F13
F06
F09
F08
F05
F04
F07
F18
F02
F16
F17
F19
F04
F03

Fig. 2.2

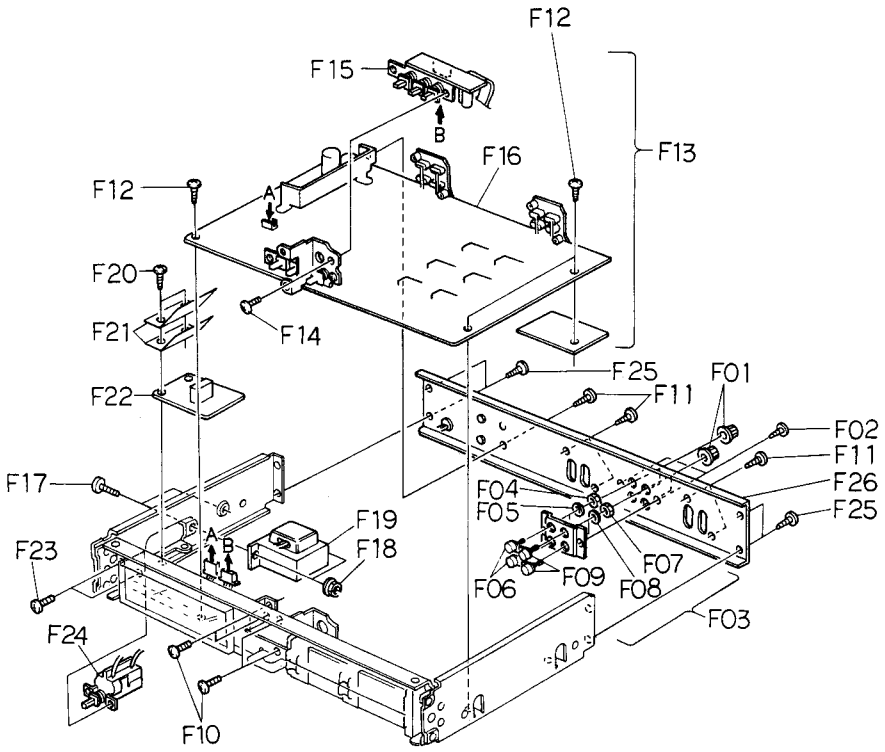
F12
F15
F16
F13
F12
F20
F21
F14
F25
F01
F22
F11
F02
F11
F17
F26
F04
F25
F05
F19
F23
F18
F07
F06
F09
F08
F03
F24
F10

Fig. 2.3

3. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

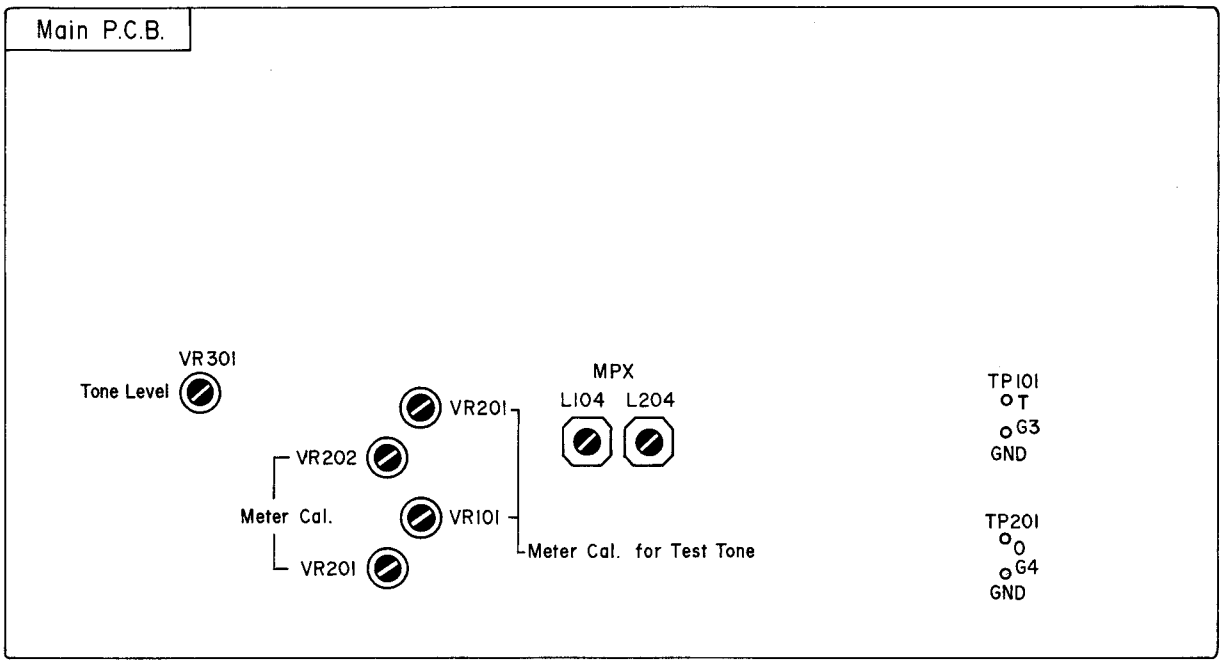

Fig. 3

4. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

4.1. Adjustment and Measurement Instructions

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Tone Level Calibration and Meter Calibration for Test Tone	Test Tone 400 Hz	VTVM to TP101, TP201 on Main P.C.B.	Monitor SW — Source Tone SW — ON Dolby NR SW — OFF	Main P.C.B. VR301 VR101, VR201	1. Adjust VR301 to obtain 90 mV —0.4 dB on the VTVM. 2. Adjust VR101 (VR201) so that the 0 dB segment of the level meter starts illuminating. 3. Adjust VR301 to obtain 90 mV on the VTVM.
2	Meter Calibration	400 Hz 90 mV —0.4 dB and 400 Hz 90 mV to Line Input Jacks	VTVM to TP101, TP201 on Main P.C.B.	Monitor SW — Source Tone SW — OFF Dolby NR SW — OFF	Main P.C.B. VR102, VR202	1. Feed in 400 Hz 90 mV —0.4 dB. 2. Adjust VR102 (VR202) so that the 0 dB segment of the level meter starts illuminating. 3. Feed in 400 Hz 90 mV, then decrease the generator output level by 20 dB. 4. Check to insure that the segment located either at 4th or 5th from the left hand of the level meter lights up.
3	MPX Filter Adjustment	19 kHz ±100 Hz to Line Input Jacks	VTVM to Line Output Jacks	Monitor SW — Source Tone SW — OFF Dolby NR SW — OFF MPX SW — OFF/ON	Main P.C.B. L104, L204	1. Set the Output level control to max. 2. Adjust the Record level controls to obtain 600 mV (0 dB) on the VTVM. 3. Set the MPX Filter switch to ON. 4. Adjust L104 (L204) to obtain the minimum reading on the VTVM (the minimum reading will be less than —30 dB).
4	Record Level Calibration	400 Hz (0 dB) to Line Input Jacks	VTVM to Line Output Jacks	Monitor SW — Tape Tone SW — OFF Dolby NR SW — OFF MPX SW — OFF		1. Connect the Record Out jacks and the Play In jacks. 2. Set the Record level controls, Master level control and Output level control to max. 3. Feed in 400 Hz 0 dB. 4. Adjust the Record Level Calibration controls on the rear panel to obtain 600 mV (0 dB) on the VTVM.
5	Overall Frequency Response Measurement	20 Hz — 20 kHz (—20 dB) to Line Input Jacks	VTVM to Line Output Jacks	Monitor SW — Tape Tone SW — OFF Dolby NR SW — B-Type/C-Type MPX SW — OFF		1. Connect the Record Out jacks and the Play In jacks. 2. Conduct step 4 "Record Level Calibration". 3. Set the Dolby NR switch to B-Type/C-Type. 4. Feed in 20 Hz — 20 kHz —20 dB, then check to insure that the readings are within —20 dB ±1 dB on the VTVM.
6	Total Harmonic Distortion Measurement	400 Hz (0 dB) to Line Input Jacks	Distortion Meter to Line Output Jacks	Monitor SW — Tape Tone SW — OFF Dolby NR SW — B-Type/C-Type MPX SW — OFF		1. Connect the Record Out jacks and the Play In jacks. 2. Conduct step 4 "Record Level Calibration". 3. Set the Dolby NR switch to B-Type/C-Type. 4. Read the distortion meter.
7	Signal to Noise Ratio Measurement	400 Hz (0 dB) to Line Input Jacks	VTVM to Line Output Jacks	Monitor SW — Tape Tone SW — OFF Dolby NR SW — B-Type/C-Type MPX SW — OFF		1. Connect the Record Out jacks and the Play In jacks. 2. Conduct step 4 "Record Level Calibration". 3. Remove the input from the Line Input jacks, then connect the signal side and ground side of the Line Input jacks with shorting plugs. 4. Set the Dolby NR switch to B-Type/C-Type. 5. Read the noise level on the VTVM. Note: The filter of IHF-A curve shall be used in the measurements.

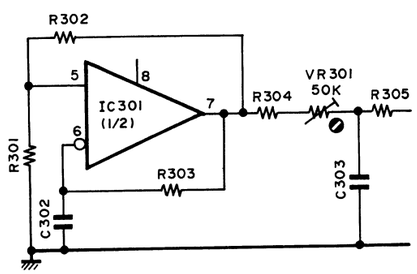

Fig. 4.1
1. Tone Level

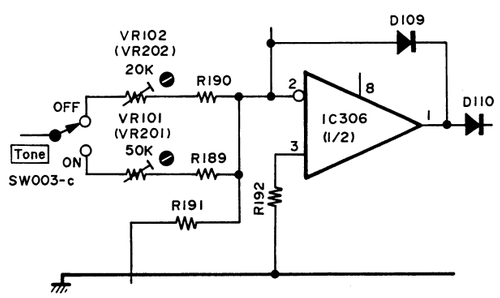

Fig. 4.2
1. Meter Calibration for Test Tone
2. Meter Calibration

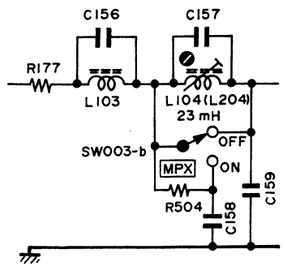

Fig. 4.3
3. MPX Filter

4.2. Dolby NR Circuit Check

Dolby NR circuit incorporates a Dolby NR IC (μA7300-PC) which has no adjustment point.
Perform the following checks and make sure that the IC operates accurately, i.e., accuracy of frequency response through IC.

4.2.1. Dolby NR B-Type Circuit Check

(1) Decoder

Signal Source: 1.4 kHz to Play In Jacks
Output Connection: VTVM to IC103-14 and IC-203-14 on the Main P.C.B.
Mode: Playback Level Calibration Controls (on Rear Panel) – max.
Dolby NR SW – B-Type/ OFF

(a) Connect a VTVM to IC103-14 (IC203-14) on the Main P.C.B.
(b) Set the Dolby NR switch to B-Type.
Feed in 1.4 kHz to the Play In jacks and adjust the generator output control to obtain 9 mV on the VTVM.
(c) Set the Dolby NR switch to OFF.
Check to insure that the reading is +3.2 dB ±1.5 dB on the VTVM.

(2) Encoder

Signal Source: 1.4 kHz to Line Input Jacks
Output Connection: VTVM to test points TP101 and TP201 on the Main P.C.B. and Record Out Jacks
Mode: Tone SW – OFF
MPX SW – OFF
Record Level Calibration Controls (on Rear Panel) – max.
Dolby NR SW – B-Type/ OFF

(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B.
(b) Feed in 1.4 kHz and adjust the Record level controls to obtain 9 mV/2.85 mV on the VTVM.
(c) Remove the VTVM from TP101 (TP201) and re-connect it to the Record Out jacks.
(d) Check to insure that the readings at the Record Out jacks correspond to the following with Dolby NR switch OFF and B-Type.

Input Level at TP101 (TP201)	Level at Record Out Jacks	
	Dolby NR OFF	Dolby NR B-Type
9 mV	0 dB	+3.2 dB ±1.5 dB
2.85 mV	0 dB	+8.2 dB ±1.5 dB

4.2.2. Dolby NR C-Type Circuit Check

(1) Decoder

Signal Source: 1.4 kHz to Play In Jacks
Output Connection: VTVM to IC103-14 and IC-203-14 on the Main P.C.B.
Mode: Playback Level Calibration Controls (on Rear Panel) – max.
Dolby NR SW – C-Type/ OFF

(a) Connect a VTVM to IC103-14 (IC203-14) on the Main P.C.B.
(b) Set the Dolby NR switch to C-Type.
Feed in 1.4 kHz to the Play In jacks and adjust the generator output control to obtain 9 mV on the VTVM.
(c) Set the Dolby NR switch to OFF.
Check to insure that the reading is +6.5 dB ±1.5 dB on the VTVM.

(2) Encoder

Signal Source: 1.4 kHz to Line Input Jacks
Output Connection: VTVM to test points TP101 and TP201 on the Main P.C.B. and Record Out Jacks
Mode: Tone SW – OFF
MPX SW – OFF
Record Level Calibration Controls (on Rear Panel) – max.
Dolby NR SW – C-Type/ OFF

(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B.
(b) Feed in 1.4 kHz and adjust the Record level controls to obtain 9 mV/2.85 mV on the VTVM.
(c) Remove the VTVM from TP101 (TP201) and re-connect it to the Record Out jacks.
(d) Check to insure that the readings at the Record Out jacks correspond to the following with Dolby NR switch OFF and C-Type.

Input Level at TP101 (TP201)	Level at Record Out Jacks	
	Dolby NR OFF	Dolby NR C-Type
9 mV	0 dB	+6.5 dB ±1.5 dB
2.85 mV	0 dB	+11.4 dB ±1.5 dB

5. MOUNTING DIAGRAMS AND PARTS LIST

Note: Mounting diagram shows a dip side view of the printed circuit board.

5.1. Indicator P.C.B. Ass'y

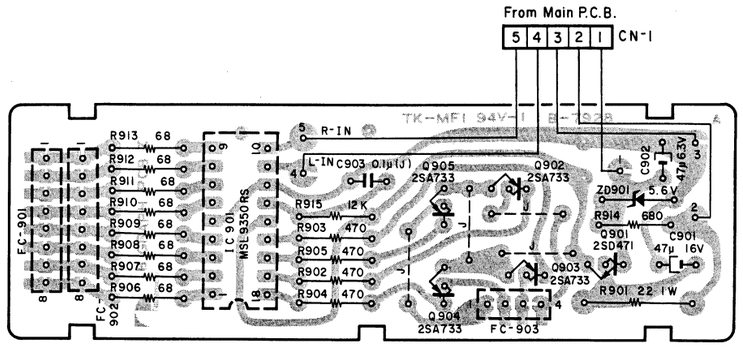

Fig. 5.1

5.2. Dolby NR Switch P.C.B. Ass'y

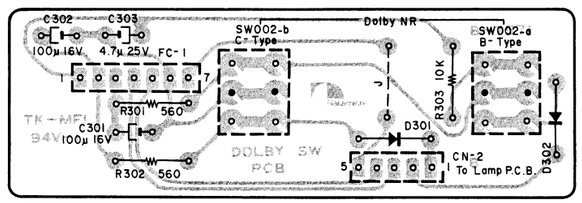

Fig. 5.2 Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04452A	**Indicator P.C.B. Ass'y**		**BA04439A**	**Dolby NR Switch P.C.B. Ass'y**
	0B07928A	Indicator P.C.B.		0B07971B	Dolby NR Switch P.C.B.
IC901	0B06284A	IC MSL9350RS	D301,302	0B06181A	Silicon Diode 1SS53
Q901	0B06066A	Transistor 2SD471	R301,302	0B05575A	Carbon Resistor 560 ERD-25T J
Q902,903	0B06013A	Transistor 2SA733	R303	0B01888A	Carbon Resistor 10K ERD-25T J
904,905			C301,302	0B01400A	Electrolytic Capacitor 100μ 16V
ZD901	0B06268A	Zener Diode 5.6V RD5.6EB3	C303	0B01402A	Electrolytic Capacitor 4.7μ 25V
R901	0B09378A	Fail Safe Type Resistor 22 RSF-1B J	CN2	0B08724A	5P-T Post
R902,903	0B05576A	Carbon Resistor 470 ERD-25T J	SW002	0B07373A	Push Switch 2-0-2
904,905				0B05235A	Flat Cable 7P (1 pce.)
R906,907	0B01704A	Carbon Resistor 68 ERD-25T J			
908,909					
910,911					
912,913					
R914	0B05794A	Carbon Resistor 680 ERD-25T J			
R915	0B09263A	Carbon Resistor 12K ERD-25T J			
C901	0B01403A	Electrolytic Capacitor 47μ 16V			
C902	0B01404A	Electrolytic Capacitor 47μ 6.3V			
C903	0B01780A	Mylar Capacitor 0.1μ 50V J			
FC901	0B05236A	Flat Cable 8P			
FC902	0B05251A	Flat Cable 8P 80mm			
FC903	0B05252A	Flat Cable 4P 35mm			
CN1	0B05258A	5P-H Connector (1 pce.)			
	0B06291A	Indicator (1 pce.)			

5.3. Lamp P.C.B. Ass'y

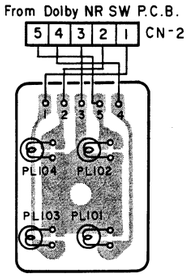

Fig. 5.3

5.4. Volume P.C.B. Ass'y

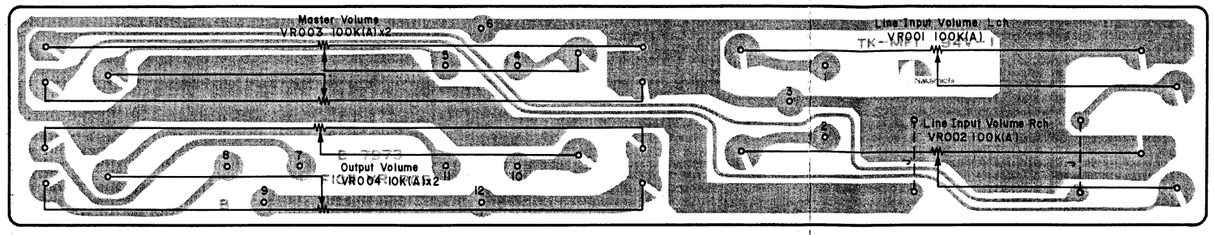

Fig. 5.4

5.5. Fuse P.C.B. Ass'y

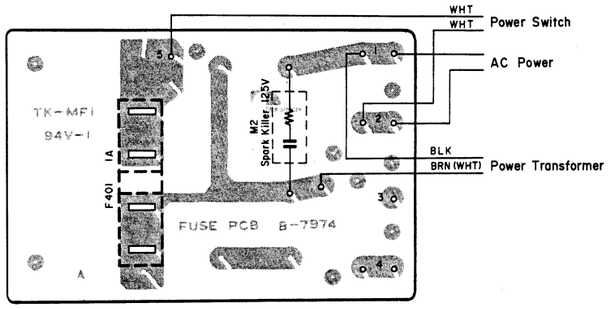

Fig. 5.5.1 U.S.A., Canada & Japan

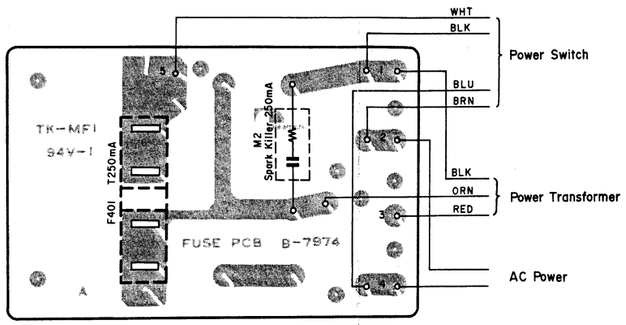

Fig. 5.5.3 UK & Australia

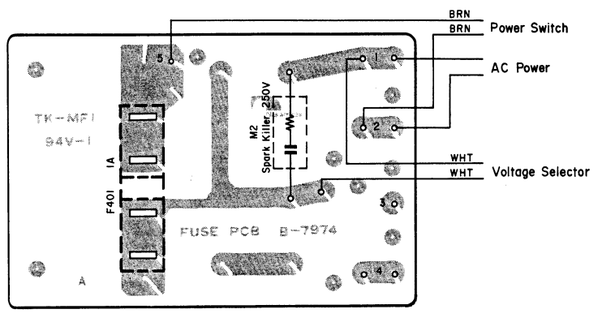

Fig. 5.5.2 Others

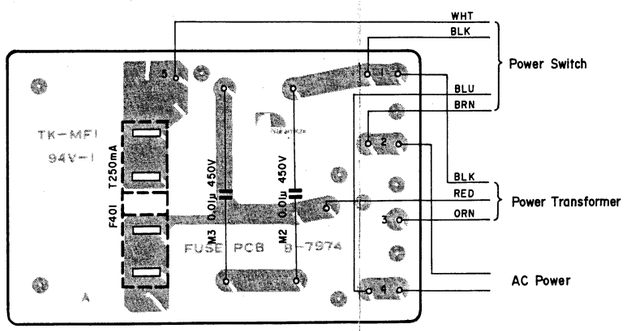

Fig. 5.5.4 220 V Class 2

Schematic Ref. No.	Part No.	Description	
	BA04440A	**Lamp P.C.B. Ass'y**	
	0B07972A	Lamp P.C.B.	
PL101,102 103,104	0B08552A	Lamp 12V 25mA	
	0B05259A	5P-H Connector	(1 pce.)
	BA04441A	**Volume P.C.B. Ass'y**	
	0B07973B	Volume P.C.B.	
VR001,002	0B07375A	Slide Volume 100K (A)	
VR003	0B07376A	Slide Volume 100K (A)x2	
VR004	0B07374A	Slide Volume 10K (A)x2	
	BA04448A	**Fuse P.C.B. Ass'y (U.S.A. & Canada)**	
	0B07974A	Fuse P.C.B.	
F401	0B08374A	Fuse 1A 250V	
	0B08342A	Spark Killer	(1 pce.)
	0M03782A	Fuse Label 1A 250V	(1 pce.)
	0E00752A	Eyelet 2x3	(9 pcs.)
	BA04443A	**Fuse P.C.B. Ass'y (Japan)**	
	0B07974A	Fuse P.C.B.	
F401	0B08686A	Fuse 1A 250V	
	0B08363A	Spark Killer	(1 pce.)
	0M03782A	Fuse Label 1A 250V	(1 pce.)
	0E00752A	Eyelet 2x3	(9 pcs.)
	BA04451A	**Fuse P.C.B. Ass'y (Others)**	
	0B07974A	Fuse P.C.B.	
F401	0B08374A	Fuse 1A 250V	
	0B08240A	Spark Killer	(1 pce.)
	0M03782A	Fuse Label 1A 250V	(1 pce.)
	0E00752A	Eyelet 2x3	(9 pcs.)
	BA04450A	**Fuse P.C.B. Ass'y (UK & Australia)**	
	0B07974A	Fuse P.C.B.	
F401	0B08252A	Fuse T250mA 250V	
	0B08240U	Spark Killer	(1 pce.)
	0B08349A	Fuse Clip	(2 pcs.)
	0M04137A	Fuse Label T250mA 250V	(1 pce.)
	0E00752A	Eyelet 2x3	(9 pcs.)
	BA04449A	**Fuse P.C.B. Ass'y (220V Class 2)**	
	0B07974A	Fuse P.C.B.	
F401	0B08252A	Fuse T250mA 250V	
	0B08445A	Spark Killer	(2 pcs.)
	0B08349A	Fuse Clip	(2 pcs.)
	0M04137A	Fuse Label T250mA 250V	(1 pce.)
	0E00752A	Eyelet 2x3	(9 pcs.)

5.6. Main P.C.B. Ass'y

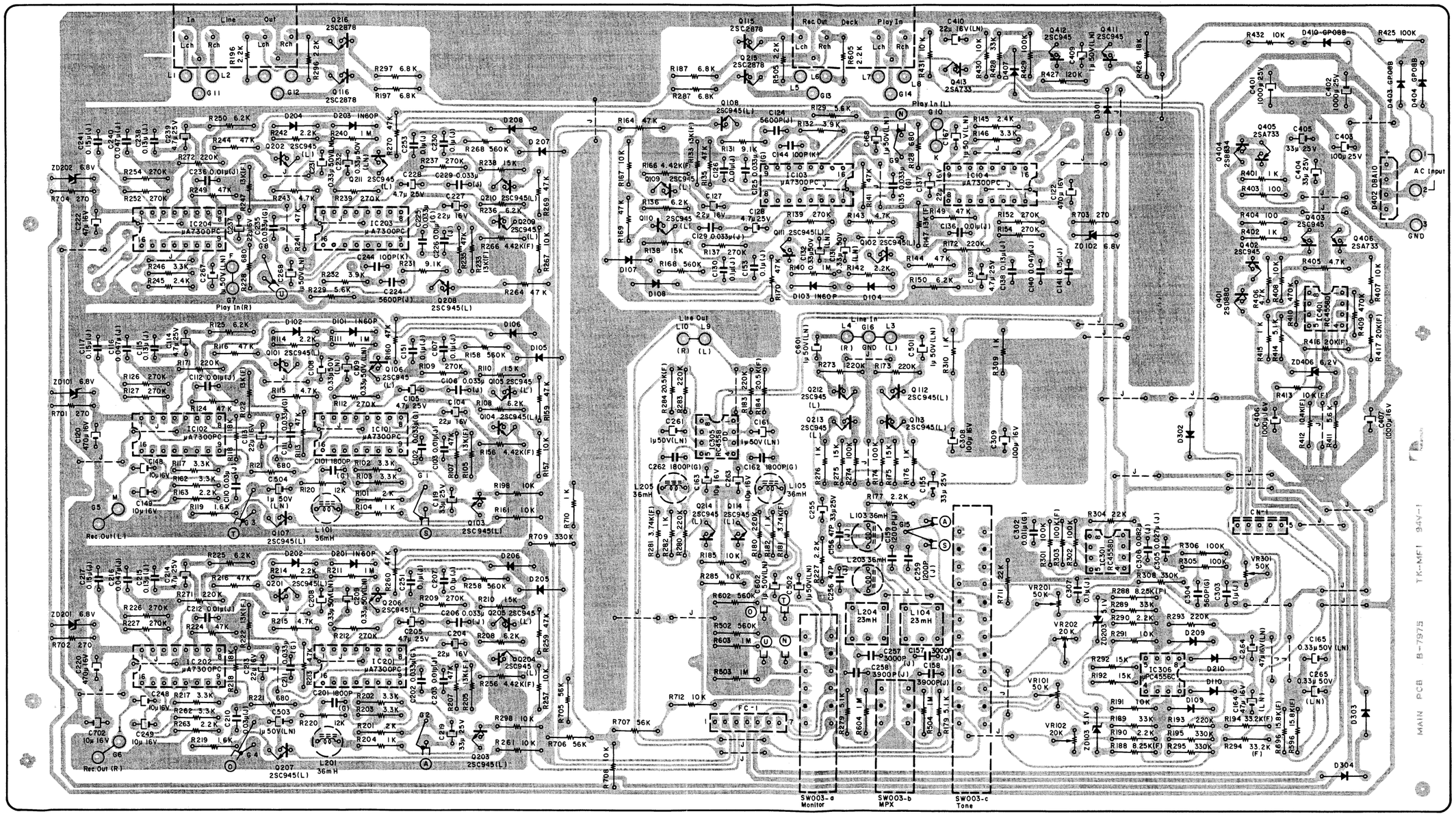

Fig. 5.6

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04442A	**Main P.C.B. Ass'y**
	— Encoder —	
IC101,102	0B06200A	IC μA7300PC
201,202		
Q101	0B01872A	Transistor 2SC945 (L)
103-107		(12 pcs.)
201		
203-207		
ZD101,201	0B06167A	Zener Diode 6.8V RD6.8EB3
D101,201	0B00030A	Germanium Diode 1N60P
D102,105	0B06181A	Silicon Diode 1SS53
106,202		
205,206		
L101,201	0B03919A	Inductor 36mH
R101,201	0B09301A	Carbon Resistor 2K ERD-25T J
R102,103	0B01681A	Carbon Resistor 3.3K ERD-25T J
117,162		
202,203		
217,262		
R104,204	0B01857A	Carbon Resistor 1K ERD-25T J
710		
R105,122	0B09557A	Metal Film Resistor 13K SN14K2E F
205,222		
R107,113	0B05641A	Carbon Resistor 47K ERD-25T J
116,124		
159,160		
207,213		
216,224		
259,260		
R108,125	0B09271A	Carbon Resistor 6.2K ERD-25T J
208,225		
R109,112	0B05620A	Carbon Resistor 270K ERD-25T J
126,127		
209,212		
226,227		
R110,210	0B01683A	Carbon Resistor 15K ERD-25T J
R111,211	0B05776A	Carbon Resistor 1M ERD-25T J
R114,163	0B05622A	Carbon Resistor 2.2K ERD-25T J
214,263		
R115,215	0B01846A	Carbon Resistor 4.7K ERD-25T J
R118,218	0B05560A	Carbon Resistor 18K ERD-25T J
R119,219	0B09565A	Carbon Resistor 1.6K ERD-25T J
R120,220	0B05571A	Carbon Resistor 12K ERD-25T J
R121,221	0B05794A	Carbon Resistor 680 ERD-25T J
R156,256	0B09558A	Metal Film Resistor 4.42K SN14K2E F
R157,161	0B01888A	Carbon Resistor 10K ERD-25T J
198,257		
261,298		
708		
R158,258	0B05784A	Carbon Resistor 560K ERD-25T J
R171,271	0B05625A	Carbon Resistor 220K ERD-25T J
R701,702	0B05645A	Carbon Resistor 270 ERD-25T J
R705,706	0B05508A	Carbon Resistor 56K ERD-25T J
707		
R709	0B05627A	Carbon Resistor 330K ERD-25T J
C101,201	0B09409A	PP Capacitor 1800P 100V G
C102,111	0B09240A	PP Capacitor 0.033μ 100V G
202,211		
C103,112	0B05681A	Mylar Capacitor 0.01μ 50V J
203,212		
C104,113	0B01862A	Electrolytic Capacitor 22μ 16V
204,213		
C105,114	0B01402A	Electrolytic Capacitor 4.7μ 25V
205,214		
C106,206	0B05583A	Mylar Capacitor 0.033μ 50V J
C107,151	0B01780A	Mylar Capacitor 0.1μ 50V J
207,251		

Schematic Ref. No.	Part No.	Description
C108,109	0B09567A	Electrolytic Capacitor 0.33μ 50V (LN)
208,209		
C110,210	0B09594A	Mylar Capacitor 0.03μ 50V J
C115,215	0B09566A	Mylar Capacitor 0.13μ 50V J
C116,216	0B05796A	Mylar Capacitor 0.047μ 50V J
C117,217	0B05914A	Mylar Capacitor 0.15μ 50V J
C119,219	0B09576A	Electrolytic Capacitor 33μ 10V
C120,220	0B01392A	Electrolytic Capacitor 470μ 16V
C148,149	0B01412A	Electrolytic Capacitor 10μ 16V
248,249		
702		
C503,504	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
	0B08714A	IC Socket 16P (4 pcs.)
	— Decoder —	
IC103,104	0B06200A	IC μA7300PC
203,204		
Q102	0B01872A	Transistor 2SC945 (L)
108-111		(10 pcs.)
202		
208-211		
ZD102,202	0B06167A	Zener Diode 6.8V RD6.8EB3
D103,203	0B00030A	Germanium Diode 1N60P
D104,107	0B06181A	Silicon Diode 1SS53
108,204		
207,208		
R128,228	0B05794A	Carbon Resistor 680 ERD-25T J
R129,229	0B01887A	Carbon Resistor 5.6K ERD-25T J
R131,231	0B09226A	Carbon Resistor 9.1K ERD-25T J
R132,232	0B05675A	Carbon Resistor 3.9K ERD-25T J
R133,147	0B09557A	Metal Film Resistor 13K SN14K2E F
233,247		
R135,141	0B05641A	Carbon Resistor 47K ERD-25T J
144,149		
164,169		
170,235		
241,244		
249,264		
269,270		
R136,150	0B09271A	Carbon Resistor 6.2K ERD-25T J
236,250		
R137,139	0B05620A	Carbon Resistor 270K ERD-25T J
152,154		
237,239		
252,254		
R138,238	0B01683A	Carbon Resistor 15K ERD-25T J
R140,240	0B05776A	Carbon Resistor 1M ERD-25T J
R142,242	0B05622A	Carbon Resistor 2.2K ERD-25T J
R143,243	0B01846A	Carbon Resistor 4.7K ERD-25T J
R145,245	0B09588A	Carbon Resistor 2.4K ERD-25T J
R146,246	0B01681A	Carbon Resistor 3.3K ERD-25T J
R166,266	0B09558A	Metal Film Resistor 4.42K SN14K2E F
R167,267	0B01888A	Carbon Resistor 10K ERD-25T J
R168,268	0B05784A	Carbon Resistor 560K ERD-25T J
R172,272	0B05625A	Carbon Resistor 220K ERD-25T J
R703,704	0B05645A	Carbon Resistor 270 ERD-25T J
C122,222	0B01392A	Electrolytic Capacitor 470μ 16V
C124,224	0B05659A	Mylar Capacitor 5600P 50V J
C125,135	0B09240A	PP Capacitor 0.033μ 100V G
225,235		
C126,136	0B05681A	Mylar Capacitor 0.01μ 50V J
226,236		
C127,137	0B01862A	Electrolytic Capacitor 22μ 16V
227,237		
C128,139	0B01402A	Electrolytic Capacitor 4.7μ 25V
228,239		
C129,229	0B05583A	Mylar Capacitor 0.033μ 50V J

Schematic Ref. No.	Part No.	Description
C130,153	0B01780A	Mylar Capacitor 0.1μ 50V J
230,253		
C131,132	0B09567A	Electrolytic Capacitor 0.33μ 50V (LN)
231,232		
C138,238	0B09566A	Mylar Capacitor 0.13μ 50V J
C140,240	0B05796A	Mylar Capacitor 0.047μ 50V J
C141,241	0B05914A	Mylar Capacitor 0.15μ 50V J
C144,244	0B09282A	Ceramic Capacitor 100P 50V K
C167,168	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
267,268		
	0B08714A	IC Socket 16P (4 pcs.)
	— Power Supply —	
IC401	0B06124B	IC RC4558D
Q401	0B06255A	Transistor 2SD880
Q402,403	0B06100A	Transistor 2SC945 (A)
411,412		
Q404	0B06256A	Transistor 2SB834
Q405,406	0B06013A	Transistor 2SA733
413		
ZD406	0B06167A	Zener Diode 6.2V RD6.2EB3
D301,407	0B06181A	Silicon Diode 1SS53
D402	0B06282A	Diode Bridge DBA10
D403,404	0B06109A	Silicon Diode GP08B
410		
R401,402	0B01857A	Carbon Resistor 1K ERD-25T J
415		
R403,404	0B01679A	Carbon Resistor 100 ERD-25T J
R405,406	0B01846A	Carbon Resistor 4.7K ERD-25T J
R407,408	0B01888A	Carbon Resistor 10K ERD-25T J
430,431		
432		
R409,410	0B01684A	Carbon Resistor 470K ERD-25T J
R411	0B01887A	Carbon Resistor 5.6K ERD-25T J
R412	0B09433A	Metal Film Resistor 10.4K SN14K2E F
R413	0B09203A	Metal Film Resistor 10K SN14K2E F
R414	0B09388A	Carbon Resistor 5.1K ERD-25T J
R416,417	0B09439A	Metal Film Resistor 20K SN14K2E F
R425,429	0B01889A	Carbon Resistor 100K ERD-25T J
R426	0B05560A	Carbon Resistor 18K ERD-25T J
R427	0B05621A	Carbon Resistor 120K ERD-25T J
R428	0B05509A	Carbon Resistor 33K ERD-25T J
C401,402	0B01870A	Electrolytic Capacitor 1000μ 25V
C403	0B01272A	Electrolytic Capacitor 100μ 25V
C404,405	0B09251A	Electrolytic Capacitor 33μ 25V
C406,407	0B01397A	Electrolytic Capacitor 1000μ 16V
C409	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C410	0B09137A	Electrolytic Capacitor 22μ 16V (LN)
	0E00507A	Nut Hex. M3 (2 pcs.)
	0E00607A	Screw M3x8 Philips Pan Head (3A) (2 pcs.)
	0E00862A	BT Screw M3x6 Philips Pan Head (2 pcs.)
	0J04390A	Heat Sink F103 (1 pce.)
	0B08601A	Transistor Mica TO-220 (2 pcs.)
	— Interface —	
IC301	0B06124B	IC RC4558D
IC305	0B06146A	IC RC4558DD
IC306	0B06216A	IC μPC4556C
Q112,113	0B01872A	Transistor 2SC945 (L)
114,212		
213,214		
Q115,116	0B06299A	Transistor 2SC2878
215,216		
ZD103,203	0B06058A	Zener Diode 5.1V YZ051

Schematic Ref. No.	Part No.	Description
D109,110	0B06181A	Silicon Diode 1SS53 (7 pcs.)
209,210		
302-304		
L103,105	0B03919A	Inductor 36mH
203,205		
L104,204	0B03563A	19 kHz Coil 23mH
VR101,201	0B07269A	Semi-fixed Volume 50K
301		
VR102,202	0B07270A	Semi-fixed Volume 20K
R173,180	0B05625A	Carbon Resistor 220K ERD-25T J
183,193		
273,280		
283,293		
R174,274	0B01889A	Carbon Resistor 100K ERD-25T J
301,302		
305,306		
R175,192	0B01683A	Carbon Resistor 15K ERD-25T J
275,292		
R176,182	0B01857A	Carbon Resistor 1K ERD-25T J
276,282		
309,310		
R177,190	0B05622A	Carbon Resistor 2.2K ERD-25T J
196,277		
290,296		
505,506		
R179,279	0B09388A	Carbon Resistor 5.1K ERD-25T J
R181,281	0B09573A	Metal Film Resistor 3.74K SN14K2E F
R184,284	0B09574A	Metal Film Resistor 20.5K SN14K2E F
R185,191	0B01888A	Carbon Resistor 10K ERD-25T J
285,291		
712		
R187,197	0B01682A	Carbon Resistor 6.8K ERD-25T J
287,297		
R188,288	0B09432A	Metal Film Resistor 8.25K SN14K2E F
R189,289	0B05509A	Carbon Resistor 33K ERD-25T J
R194,294	0B09446A	Metal Film Resistor 33.2K SN14K2E F
R195,295	0B05627A	Carbon Resistor 330K ERD-25T J
308		
R303	0B09305A	Metal Film Resistor 100K SN14K2E F
R304,711	0B05615A	Carbon Resistor 22K ERD-25T J
R502,602	0B05784A	Carbon Resistor 560K ERD-25T J
R503,504	0B05776A	Carbon Resistor 1 M ERD-25T J
603,604		
R596,696	0B09437A	Metal Film Resistor 15.8K SN14K2E F
C155,255	0B09251A	Electrolytic Capacitor 33μ 25V
C156,256	0B09242A	Mica Capacitor 47P 50V J
C157,257	0B09262A	PP Capacitor 3000P 100V J
C158,258	0B01804A	Mylar Capacitor 3900P 50V J
C159,259	0B05687A	Mylar Capacitor 1200P 50V J
C161,261	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
501,502		
601,602		
C162,262	0B09409A	PP Capacitor 1800P 100V G
C163,263	0B01412A	Electrolytic Capacitor 10μ 16V
C164,264	0B09218A	Electroltyic Capacitor 47μ 16V (LN)
C165,265	0B09327A	Electrolytic Capacitor 0.33μ 50V (LN)
C302	0B09412A	PP Capacitor 0.011μ 100V G
C303,307	0B01780A	Mylar Capacitor 0.1μ 50V J
C304	0B09414A	PP Capacitor 560P 100V G
C305	0B09045A	Mylar Capacitor 0.027μ 50V J
C306	0B05685A	Mylar Capacitor 0.082μ 50V J
C308,309	0B01400A	Electrolytic Capacitor 100μ 16V
SW003	0B07372A	Push Switch 8-2-4
CN1	0B08724A	5P-T Post
	0B08889A	4P Pin Jack (2 pcs.)
	— Miscellaneous —	
	0B07975B	Main P.C.B.

6. MECHANISM ASS'Y AND PARTS LIST

6.1. Synthesis Mechanism Ass'y

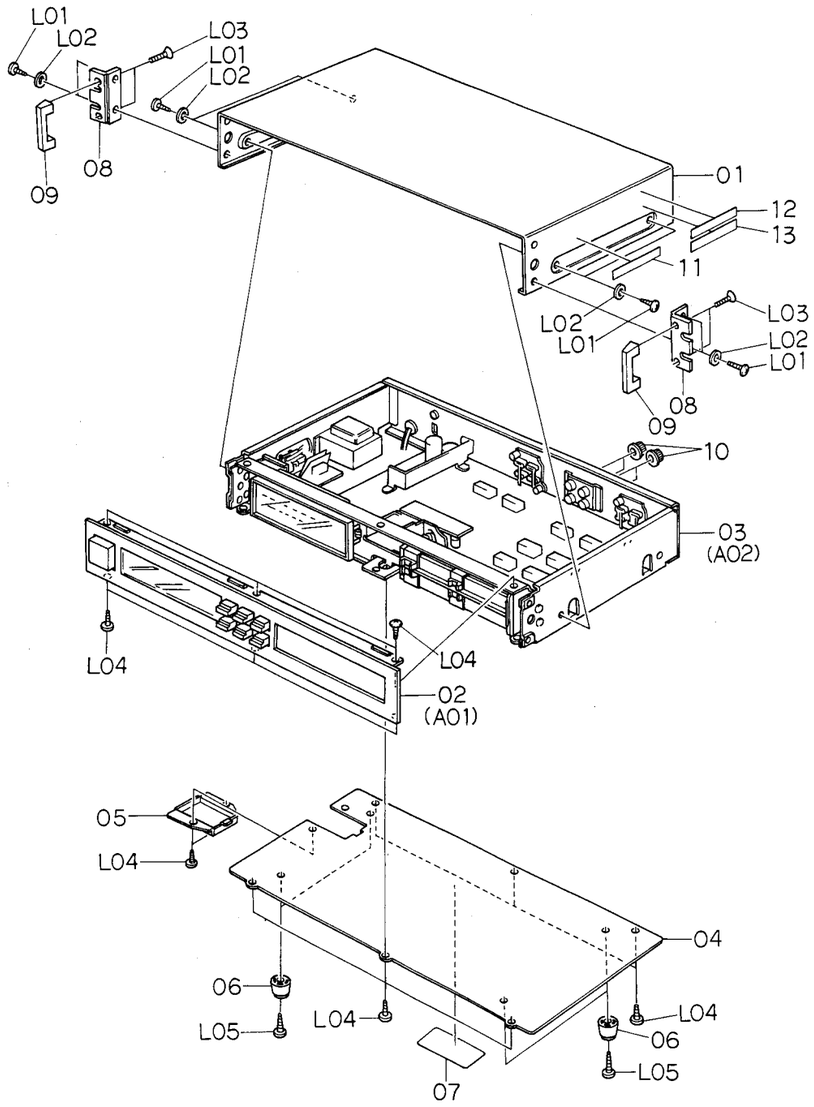

Fig. 6.1

6.2. Front Panel Ass'y (A01)

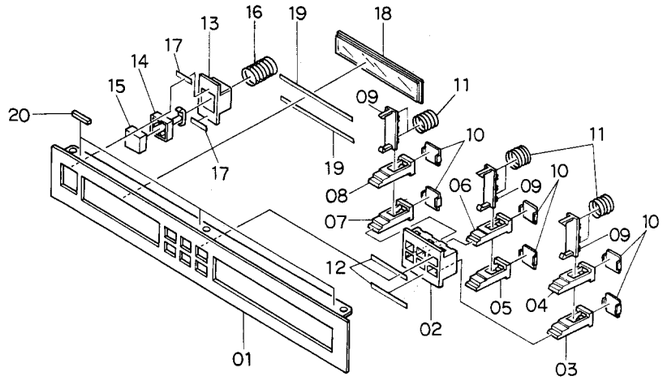

Fig. 6.2

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
	HA04159A	**Synthesis Mechanism Ass'y (U.S.A. & Canada)**	**1**	**A01**	**HA04163A**	**Front Panel Ass'y** Serial No.: F10301001 –	**1**
	HA04158A	**Synthesis Mechanism Ass'y (Japan)**	**1**				
	HA04162A	**Synthesis Mechanism Ass'y (Others)**	**1**	01	0H03965B	Front Panel	1
	HA04160A	**Synthesis Mechanism Ass'y (220V Class 2)**	**1**	02	0H03972A	Switch Flange	1
	HA04161A	**Synthesis Mechanism Ass'y (UK)**	**1**	03	0H03971B	Monitor Switch Knob	1
	HA04169A	**Synthesis Mechanism Ass'y (Australia)** Serial No.: F10301001 –	**1**	04	0H03968B	C-Type Switch Knob	1
				05	0H03970B	MPX Switch Knob	1
				06	0H03967B	OFF Switch Knob	1
				07	0H03969B	Tone Switch Knob	1
				08	0H03966B	B-Type Switch Knob	1
				09	0J04423B	Switch Flange Holder	3
				10	0J04424A	Switch Knob Cover	6
01	0H03962A	Top Cover	1	11	0J04383B	Push Switch Knob Spring	6
02	HA04163A	Front Panel Ass'y	1	12	0H03973A	Double-faced Tape for Switch Flange	2
03	JA03876A	Chassis Ass'y (U.S.A. & Canada)	1				
	JA03877A	Chassis Ass'y (Japan)	1	13	0H03956A	Power Switch Flange	1
	JA03873A	Chassis Ass'y (Others)	1	14	0H03955A	Power Switch Knob	1
	JA03874A	Chassis Ass'y (UK)	1	15	0H03954A	Power Switch Cover	1
	JA03875A	Chassis Ass'y (220V Class 2)	1	16	0J04384A	Power Switch Spring	1
	JA03879A	Chassis Ass'y (Australia)	1	17	0H03957A	Double-faced Tape for Power Switch	2
04	0J04377A	Bottom Cover	1				
05	0J04378A	Transformer Cover	1	18	0H03974A	Acrylic Scale	1
06	0J03564A	Leg	4	19	0H03953A	Double-faced Tape for Acrylic Scale	2
07	0M04101A	Caution Label	1				
08	0H03963A	Side Plate	2	20	0H03960A	Cushion	3
09	0H03964A	Handle	2				
10	0H03296B	Volume Knob	4				
11	0M03800A	Caution Label H	1				
12	0M03799A	Caution Label G	1				
13	0M03883B	Lamp Caution Label	1				
L01	0E00953A	BT Screw M4x8 Philips Binding Head (Chromate)	8				
L02	0E00736A	Washer 4mm (Black Chromate)	8				
L03	0E00908A	Screw M4x6 Philips Countersunk (Black Chromate)	4				
L04	0E00857A	BT Screw M3x6 Philips Binding Head	12				
L05	0E00865A	BT Screw M3x8 Philips Binding Head (Chromate)	4				

6.3. Chassis Ass'y (A02)

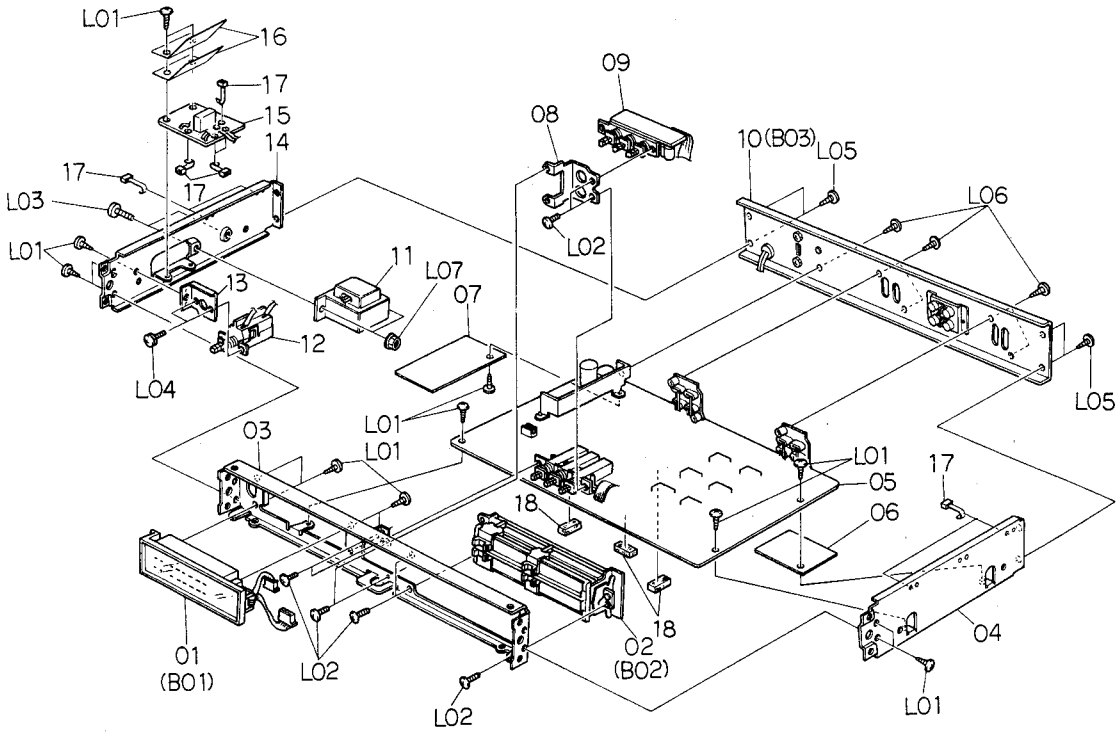

Fig. 6.3

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
A02	**JA03876A**	**Chassis Ass'y (U.S.A. & Canada)**	**1**	12	0B07299A	Power Switch (U.S.A. & Canada)	1
	JA03877A	**Chassis Ass'y (Japan)**	**1**		0B07301A	Power Switch (Japan)	1
	JA03873A	**Chassis Ass'y (Others)**	**1**		0B07252A	Power Switch (Others, UK, Australia & 220V Class 2)	1
	JA03874A	**Chassis Ass'y (UK)**	**1**				
	JA03875A	**Chassis Ass'y (220V Class 2)**	**1**	13	0J04419A	Power Switch Holder	1
	JA03879A	**Chassis Ass'y (Australia)**	**1**	14	0J04386B	Side Chassis L	1
		Serial No.: F10301001 –		15	BA04448A	Fuse P.C.B. Ass'y (U.S.A. & Canada)	1
					BA04443A	Fuse P.C.B. Ass'y (Japan)	1
01	JA03855A	Indicator Ass'y	1		BA04451A	Fuse P.C.B. Ass'y (Others)	1
02	JA03852A	Slide Volume Ass'y	1		BA04450A	Fuse P.C.B. Ass'y (UK & Australia)	1
03	0J04385B	Front Chassis	1				
04	0J04387B	Side Chassis R	1		BA04449A	Fuse P.C.B. Ass'y (220V Class 2)	1
05	BA04442A	Main P.C.B. Ass'y	1	16	0J04434A	Insulator	2
06	0J04437A	Fiber A	1	17	0B08515A	Insu-Lock	22
07	0J04438A	Fiber B	1	18	0J04342A	Cushion	3
08	0J04382A	Switch Holder	1	L01	0E00857A	BT Screw M3x6 Philips Binding Head	15
09	BA04439A	Dolby NR Switch P.C.B. Ass'y	1				
10	HA04165A	Rear Panel Ass'y (U.S.A. & Canada)	1	L02	0E00896A	Screw M3x6 Philips Binding Head	9
				L03	0E00953A	Screw M4x10 Philips Binding Head (Black Chromate)	2
	HA04164A	Rear Panel Ass'y (Japan)	1				
	HA04168A	Rear Panel Ass'y (Others)	1	L04	0E00612A	Screw M3x6 Philips Pan Head (2A)	2
	HA04167A	Rear Panel Ass'y (UK)	1				
	HA04166A	Rear Panel Ass'y (220V Class 2)	1	L05	0E00921A	BT Screw M3x8 Philips Binding Head (Black Chromate)	4
	HA04170A	Rear Panel Ass'y (Australia)	1				
11	0B06658A	Power Transformer (U.S.A. & Canada)	1	L06	0E00860A	BT Screw M3x6 Philips Binding Head (Bronze)	5
	0B06657A	Power Transformer (Japan)	1	L07	0E00928A	Nut Hex. M4	2
	0B06660A	Power Transformer (Others)	1				
	0B06659A	Power Transformer (UK, 220V Class 2 & Australia)	1				

6.4. Indicator Ass'y (B01)

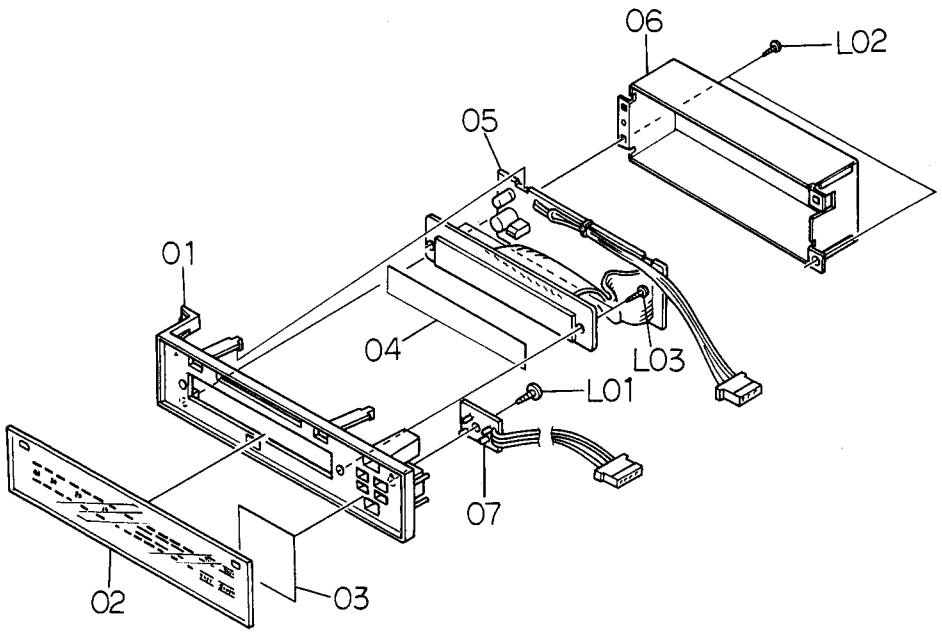

Fig. 6.4

Schematic Ref. No.	Part No.	Description	Q'ty
B01	**JA03855A**	**Indicator Ass'y** Serial No.: F10301001 –	**1**
01	0J04381A	Indicator Holder	1
02	0J04380A	Indicator Scale	1
03	0H03990A	Deflecting Sheet	1
04	0H03988A	Indicator Filter	1
05	BA04452A	Indicator P.C.B. Ass'y	1
06	0J04379A	Indicator Cover	1
07	BA04440A	Lamp P.C.B. Ass'y	1
L01	0E00857A	BT Screw M3x6 Philips Binding Head	1
L02	0E00853A	BT Screw M2x3 Philips Pan Head	2
L03	0E00841A	BT Screw M2x4 Philips Pan Head	2

6.5. Slide Volume Ass'y (B02)

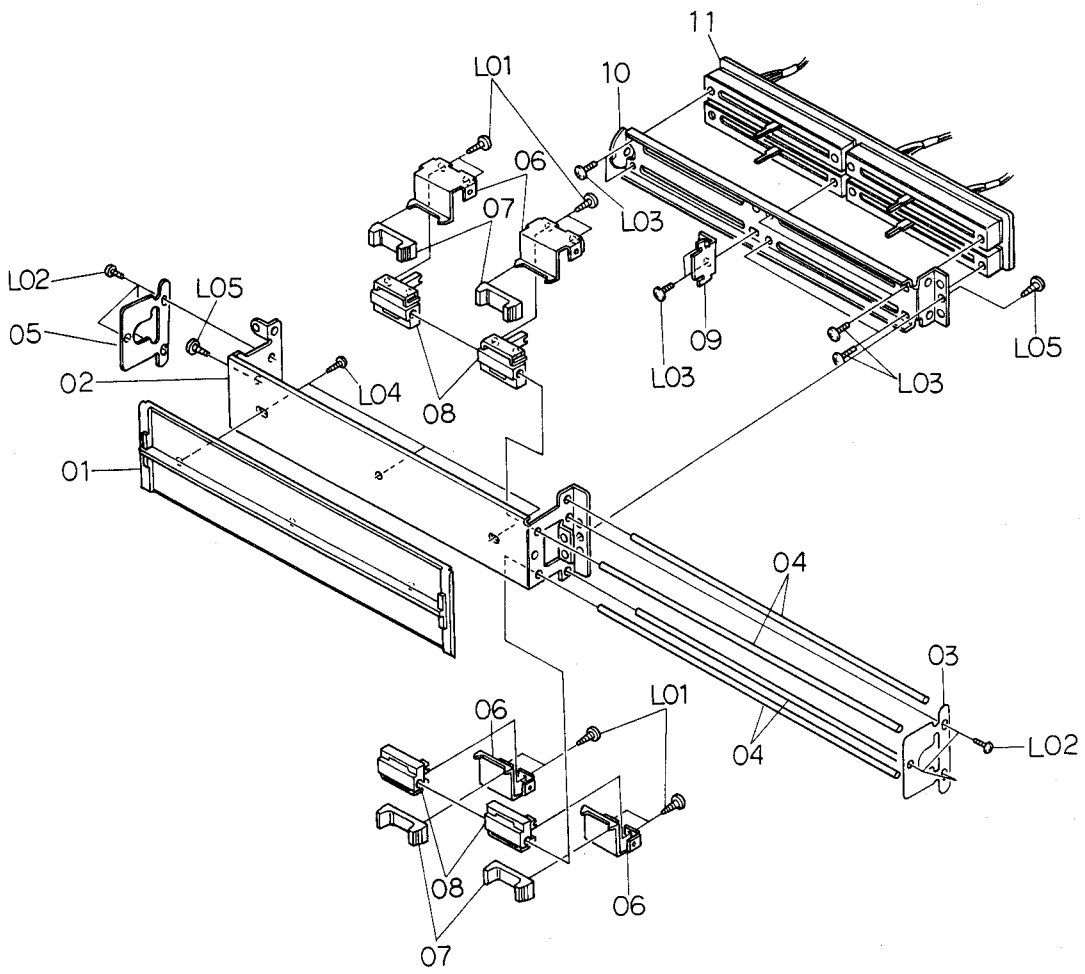

Fig. 6.5

Schematic Ref. No.	Part No.	Description	Q'ty
B02	**JA03852A**	**Slide Volume Ass'y** Serial No.: F10301001 –	**1**
01	0J04376B	Volume Mounting Cover	1
02	0J04371C	Bar Holder	1
03	0T04430A	Slide Shaft Holder B	1
04	0T04373A	Slide Shaft	4
05	0T04375B	Slide Shaft Holder	1
06	0T04393A	Slide Volume Holder	4
07	0H03959B	Slide Volume Knob	4
08	0J04372A	Slide Holder	4
09	0T04429A	Shaft Protector	1
10	0J04374B	Volume Holder	1
11	BA04441A	Volume P.C.B. Ass'y	1
L01	0E00828A	BT Screw M2.6x8 Philips Binding Head (Chromate)	8
L02	0E00790A	ST Screw M2x3 Philips Pan Head (Black Chromate)	6
L03	0E00502A	Screw M3x5 Philips Pan Head	8
L04	0E00841A	BT Screw M2x4 Philips Pan Head	3
L05	0E00857A	BT Screw M3x6 Philips Binding Head	2

6.6. Rear Panel Ass'y (B03)

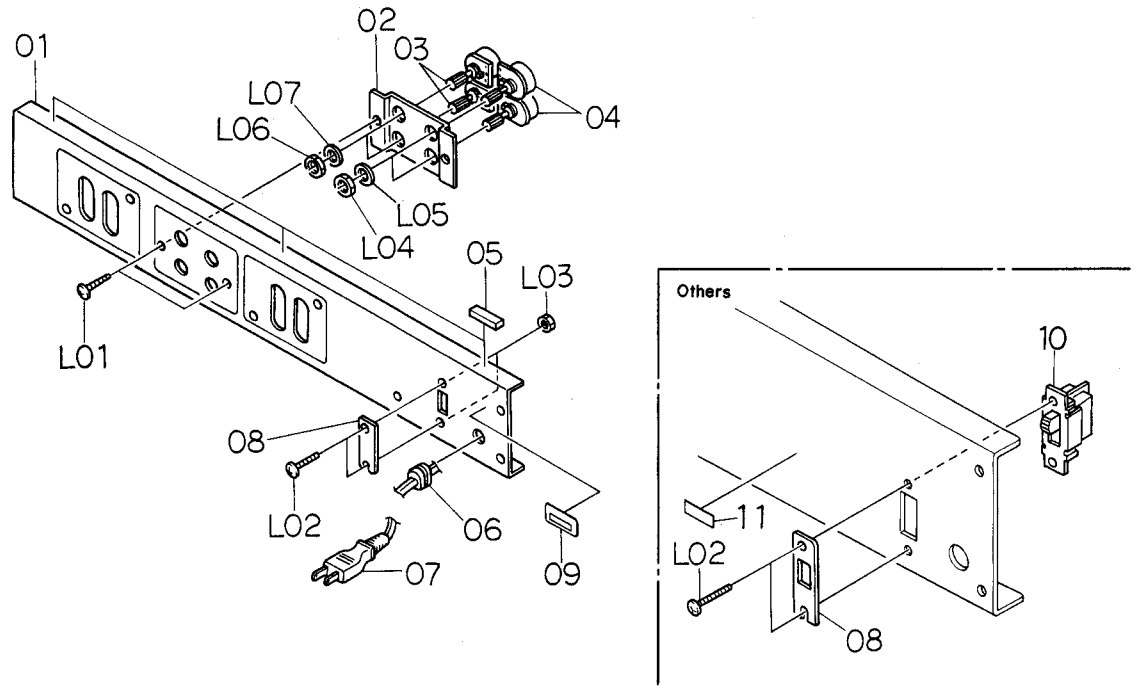

Fig. 6.6

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
B03	**HA04165A**	**Rear Panel Ass'y (U.S.A. & Canada)**	**1**	11	0M03794A	Voltage Seal 100 V (Japan)	1
					0M03955A	Voltage Seal 120V/220-240V (Others)	1
	HA04164A	**Rear Panel Ass'y (Japan)**	**1**				
	HA04168A	**Rear Panel Ass'y (Others)**	**1**		0M03797A	Voltage Seal 240V (UK & Australia)	1
	HA04167A	**Rear Panel Ass'y (UK)**	**1**				
	HA04166A	**Rear Panel Ass'y (220V Class 2)**	**1**		0M03796A	Voltage Seal 220V (220V Class 2)	1
	HA04170A	**Rear Panel Ass'y (Australia)**	**1**	–	0M04279A	Serial Number Plate	1
		Serial No.:		–	0M03458B	Pass Label	1
		F10301001 –		L01	0E00860A	BT Screw M3x6 Philips Binding Head (Black Chromate)	2
01	0J04388A	Rear Panel	1	L02	0E00593A	Screw M3x6 Philips Binding Head (Bronze)	2
02	0J04422A	Volume Holder	1				
03	0B07311A	Volume 10K (B)	2	L03	0E00507A	Nut Hex. M3	2
04	0B07312A	Volume 50K (B)	2	L04	–	Volume Nut	(1)
05	0H03960A	Cushion	3	L05	–	Volume Washer	(1)
06	0B08037U	Cord Bushing (U.S.A., Canada, Japan, Others, 220V Class 2 & Australia)	1	L06	–	Volume Nut	(1)
				L07	–	Volume Washer	(1)
	0B08351A	Cord Bushing (UK)	1				
07	0B08533A	Power Cord (U.S.A., Canada & Others)	1				
	0B08219B	Power Cord (Japan)	1				
	0B08348A	Power Cord (UK)	1				
	0B08093U	Power Cord (220V Class 2)	1				
	0B05241A	Power Cord (Australia)					
08	0J03663C	Switch Cover C (U.S.A., Canada, Japan & 220V Class 2)	1				
	0M03946A	Voltage Selector Lock Plate (Others)	1				
09	0M04269A	Rating Label	1				
10	0B07092U	Voltage Selector (Others)	1				

7. BLOCK DIAGRAM

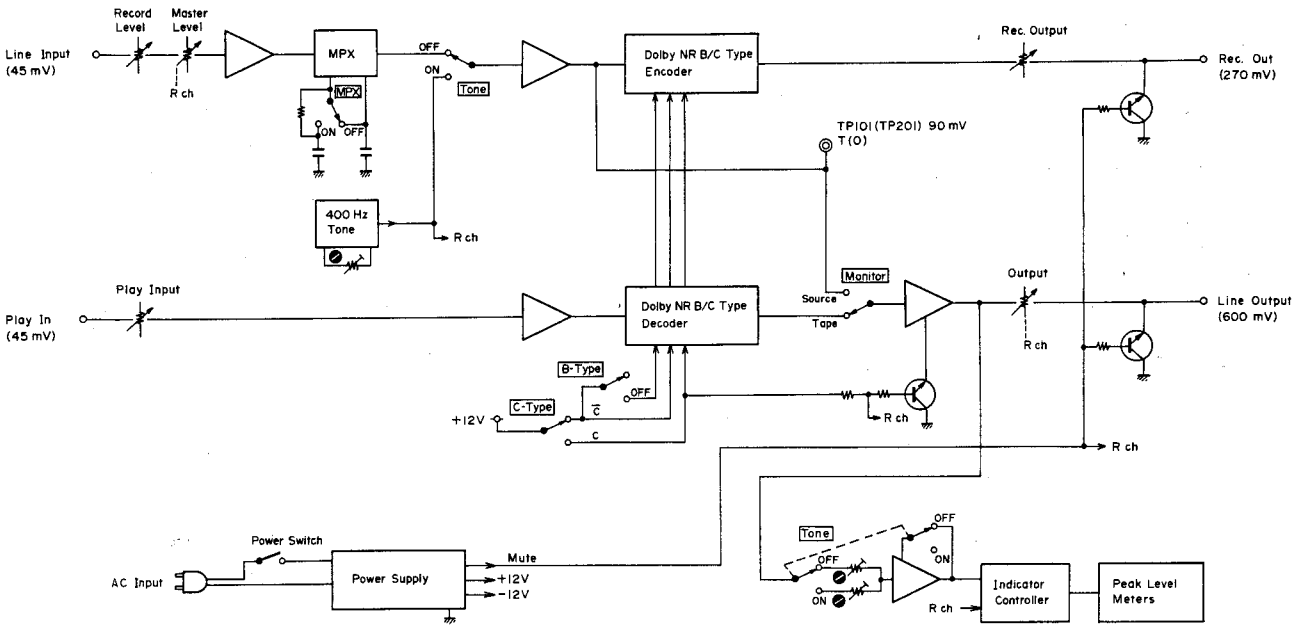

Fig. 7

8. PERFORMANCE DATA

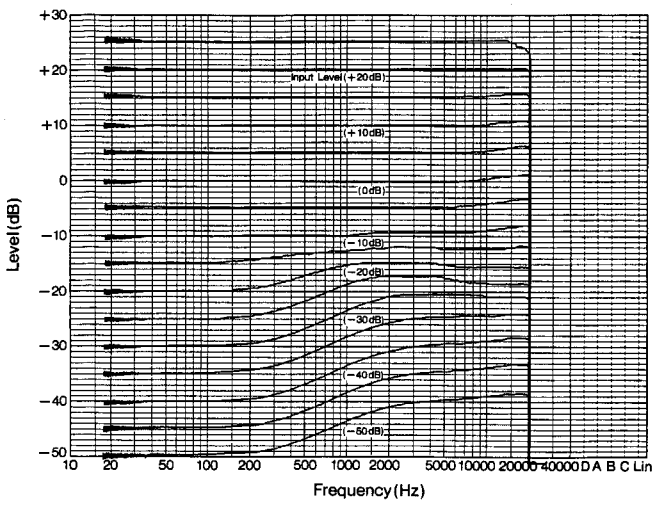

Fig. 8.1 Dolby NR B-Type Encode Characteristics (Level vs. Frequency)

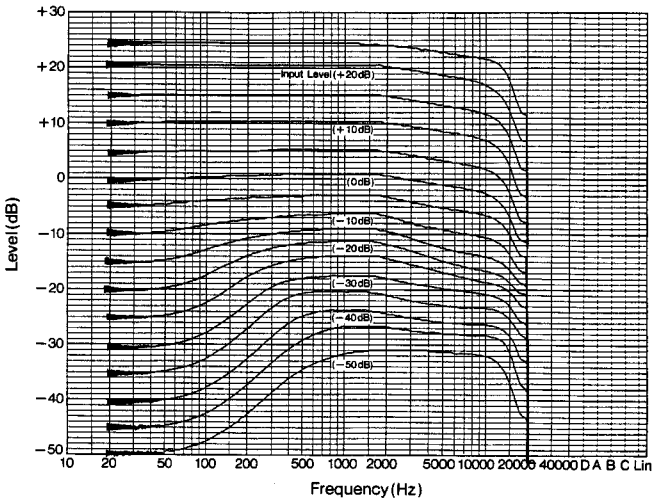

Fig. 8.2 Dolby NR C-Type Encode Characteristics (Level vs. Frequency)

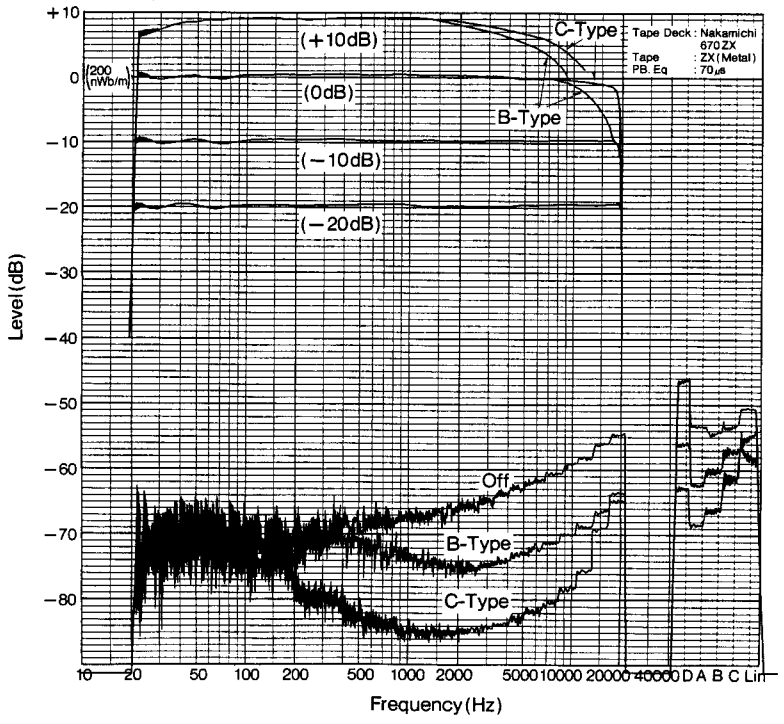

Fig. 8.3 Frequency Response/Noise Spectrum Analysis

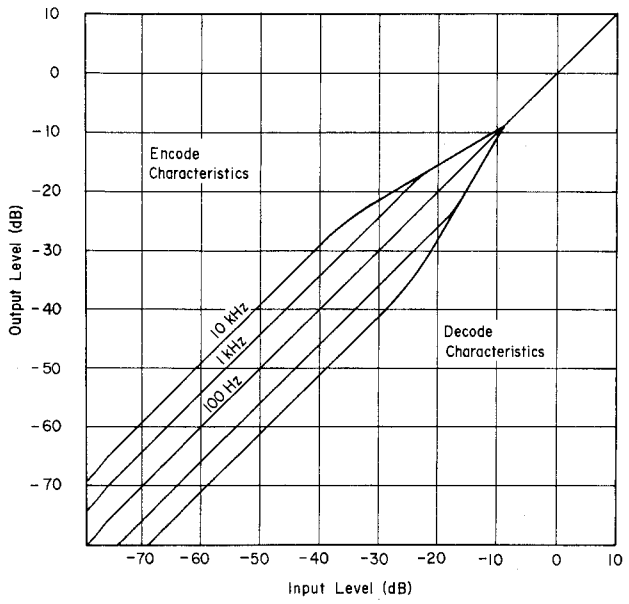

Fig. 8.4 Dolby NR B-Type Encoding and Decoding Characteristics

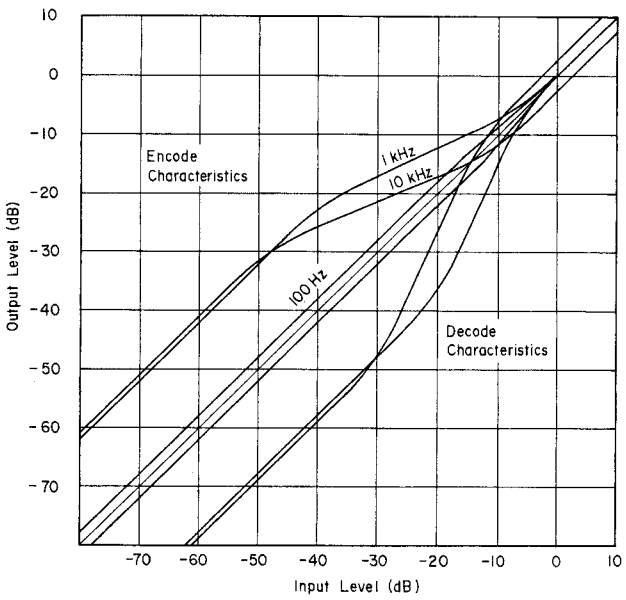

Fig. 8.5 Dolby NR C-Type Encoding and Decoding Characteristics

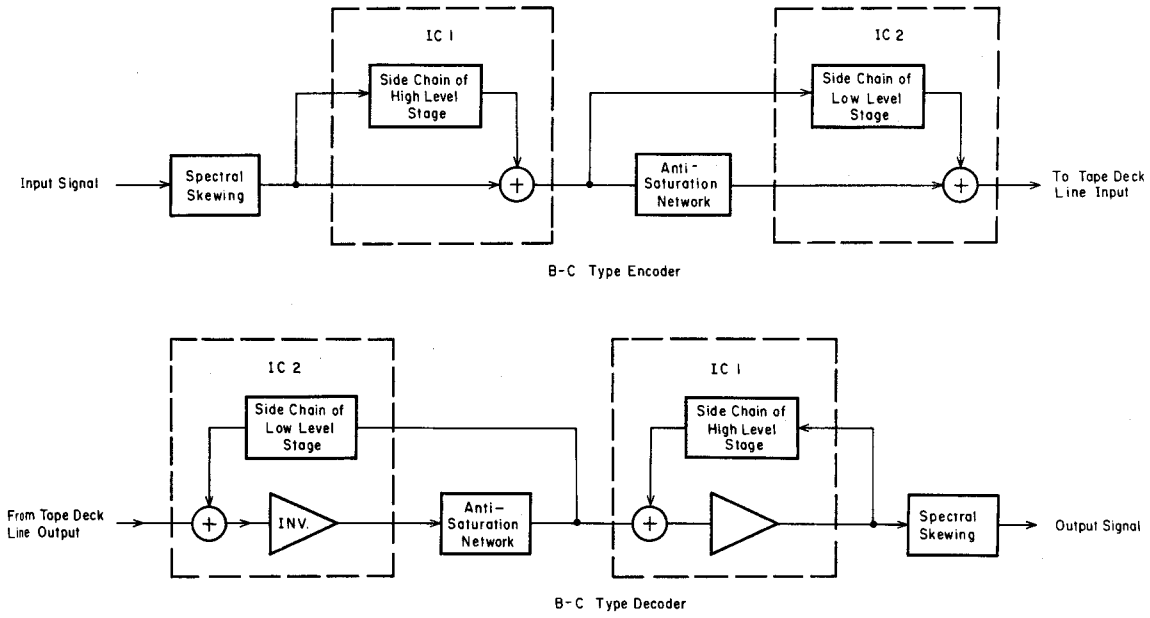

Fig. 8.6 Dolby NR B-C Type Encoder/Decoder Block Diagram

9. WIRING DIAGRAM

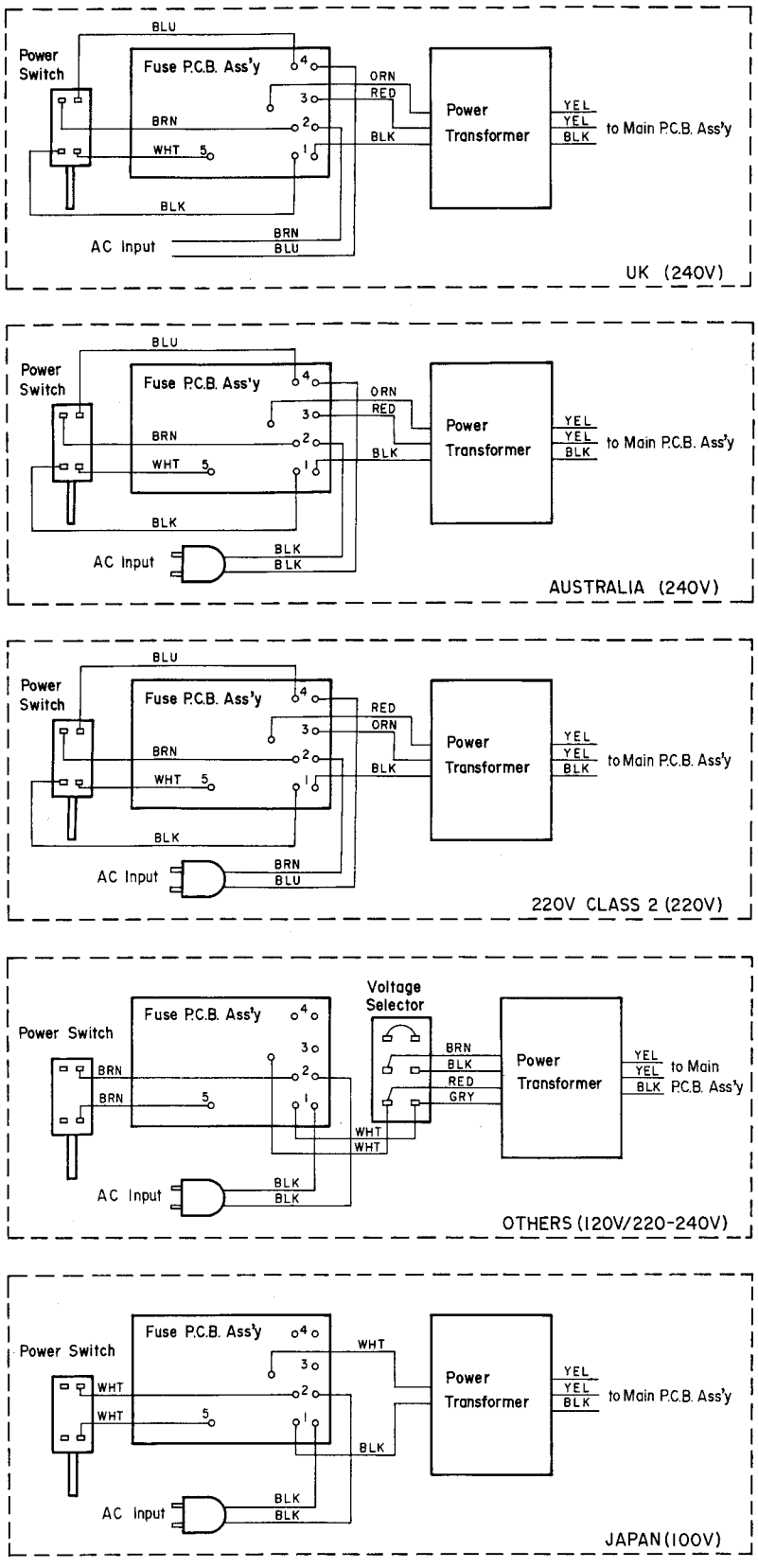

Fig. 9.1

Note: Table or wire colors:

BLK – Black	ORN – Orange
BLU – Blue	GRY – Gray
GRN – Green	BRN – Brown
RED – Red	YEL – Yellow
WHT – White	VIO – Violet

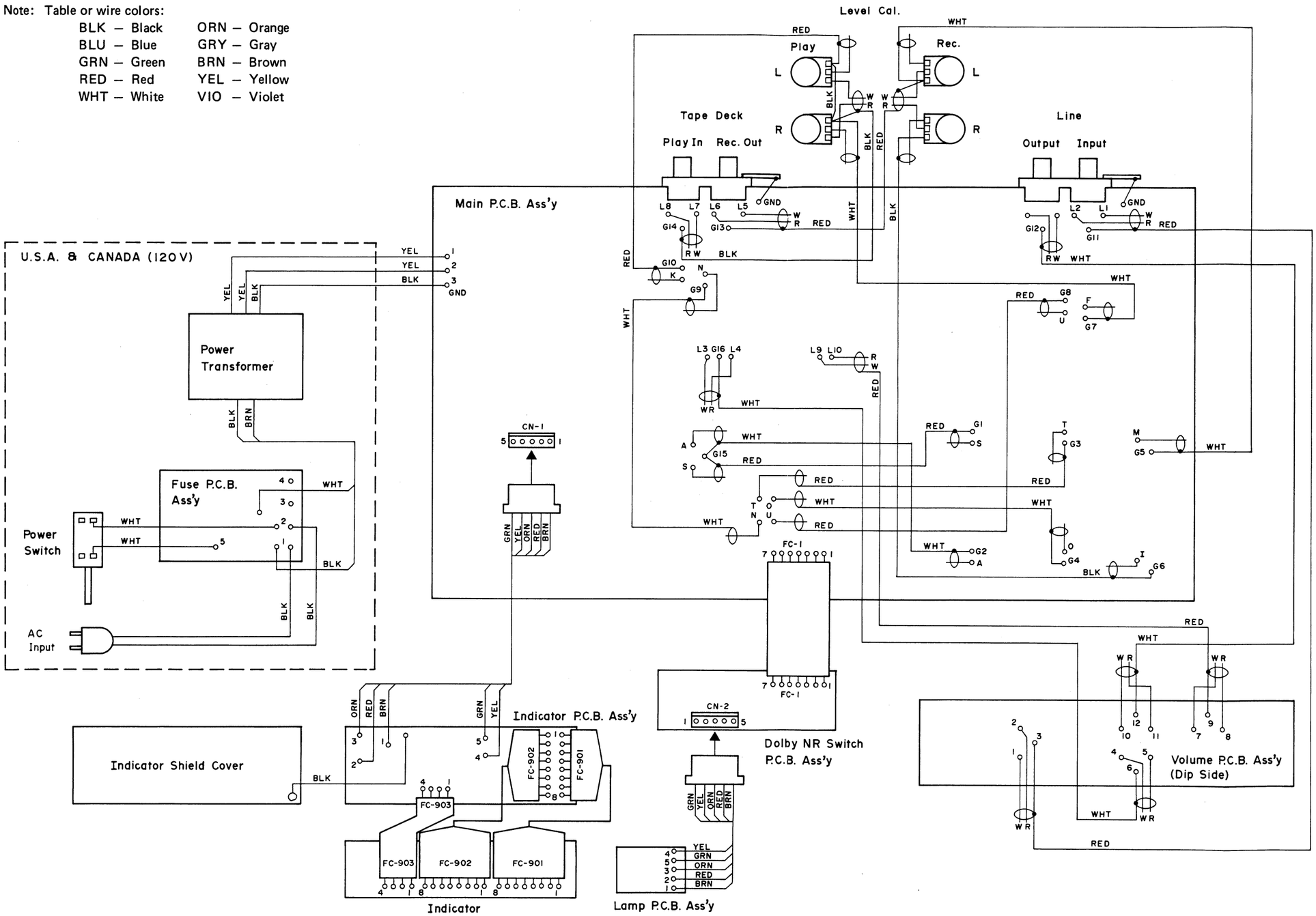

Fig. 9.2

10. SCHEMATIC DIAGRA

10.1. IC Block Diagrams

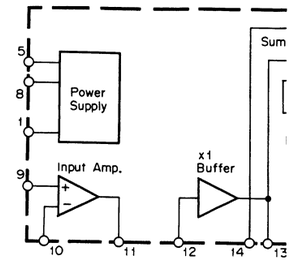

Fig. 10.

Outpu

Inverting Inpu

Non-Invert Inpu

Fig. 10

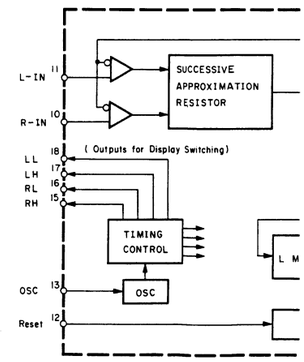

Fig. 10.3 Le

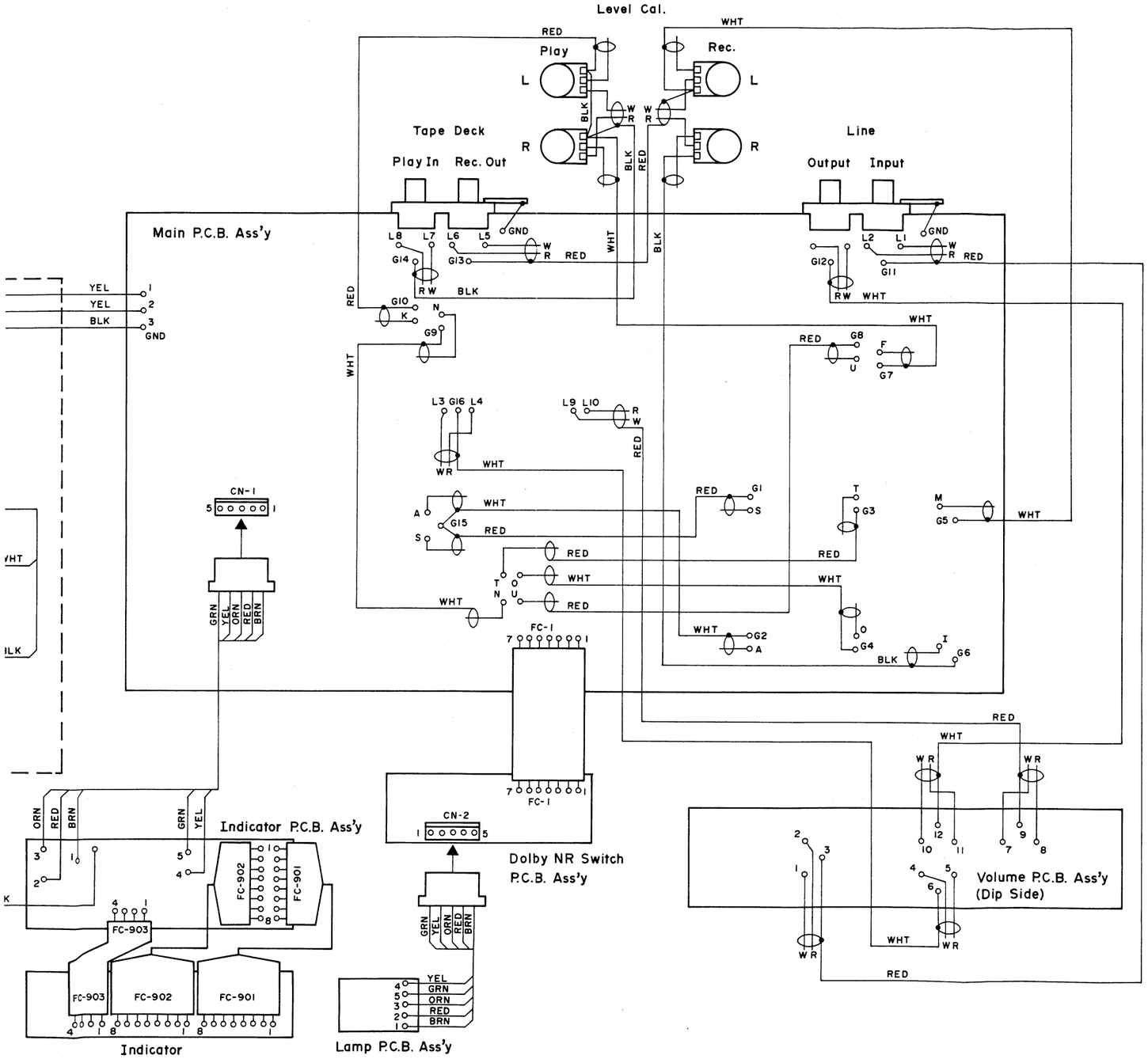

Fig. 9.2

10. SCHEMATIC DIAGRAM

10.1. IC Block Diagrams

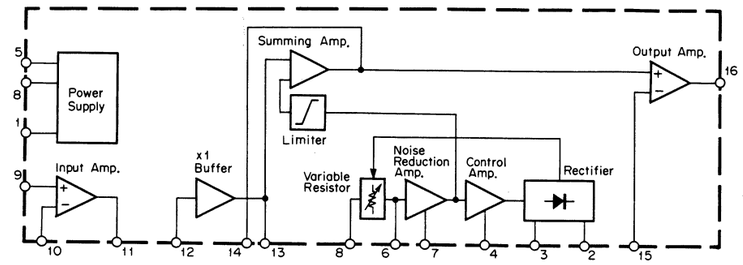

Fig. 10.1 Dolby NR IC μA7300PC

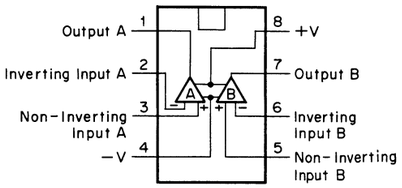

Fig. 10.2 OP Amp. IC 4558, 4556

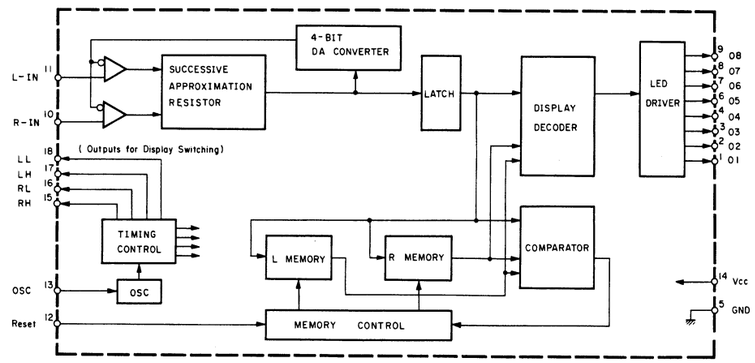

Fig. 10.3 Level Meter Control IC MSL9350RS

10.2. Schematic Diagram

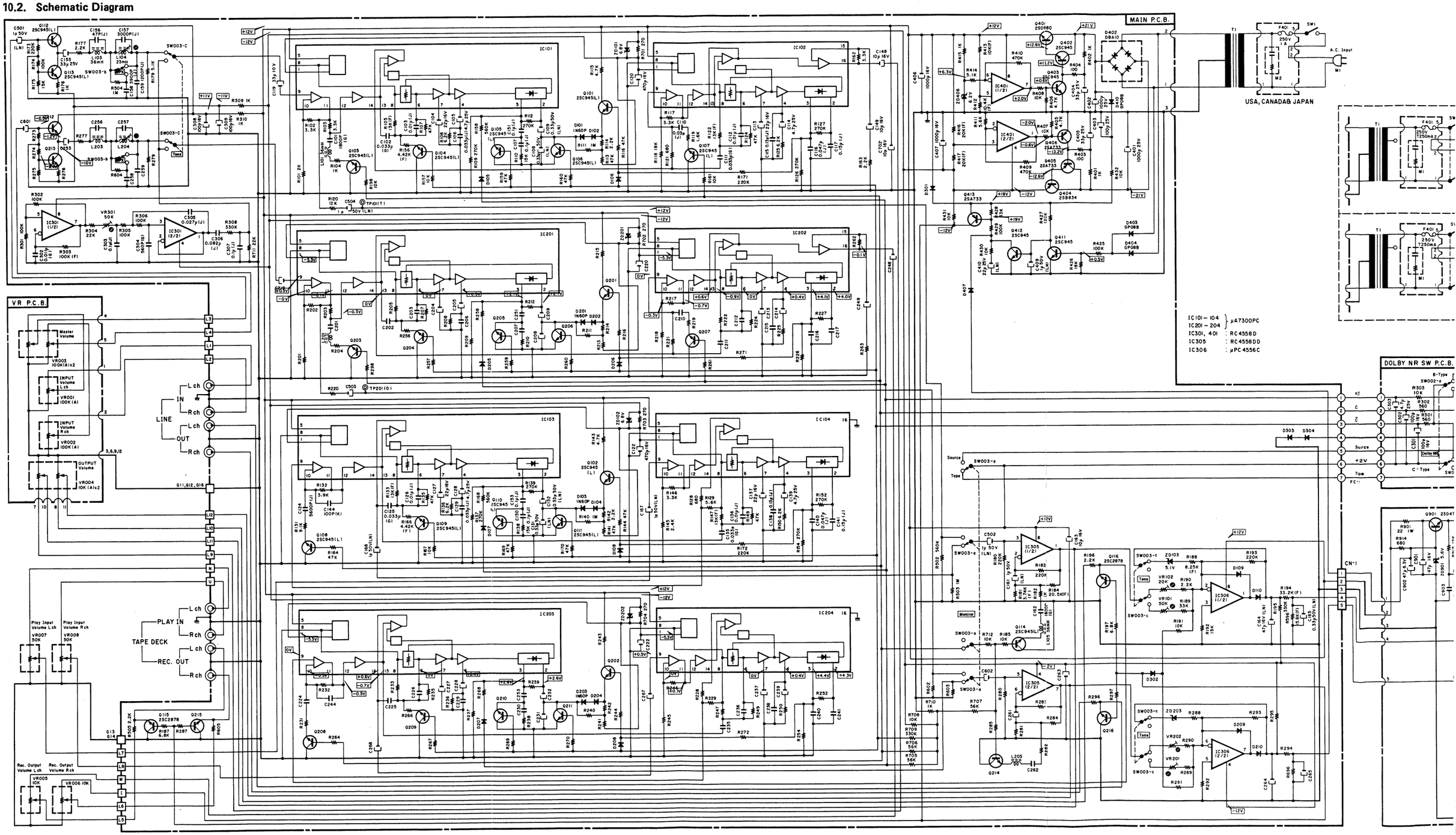

Fig. 10.4

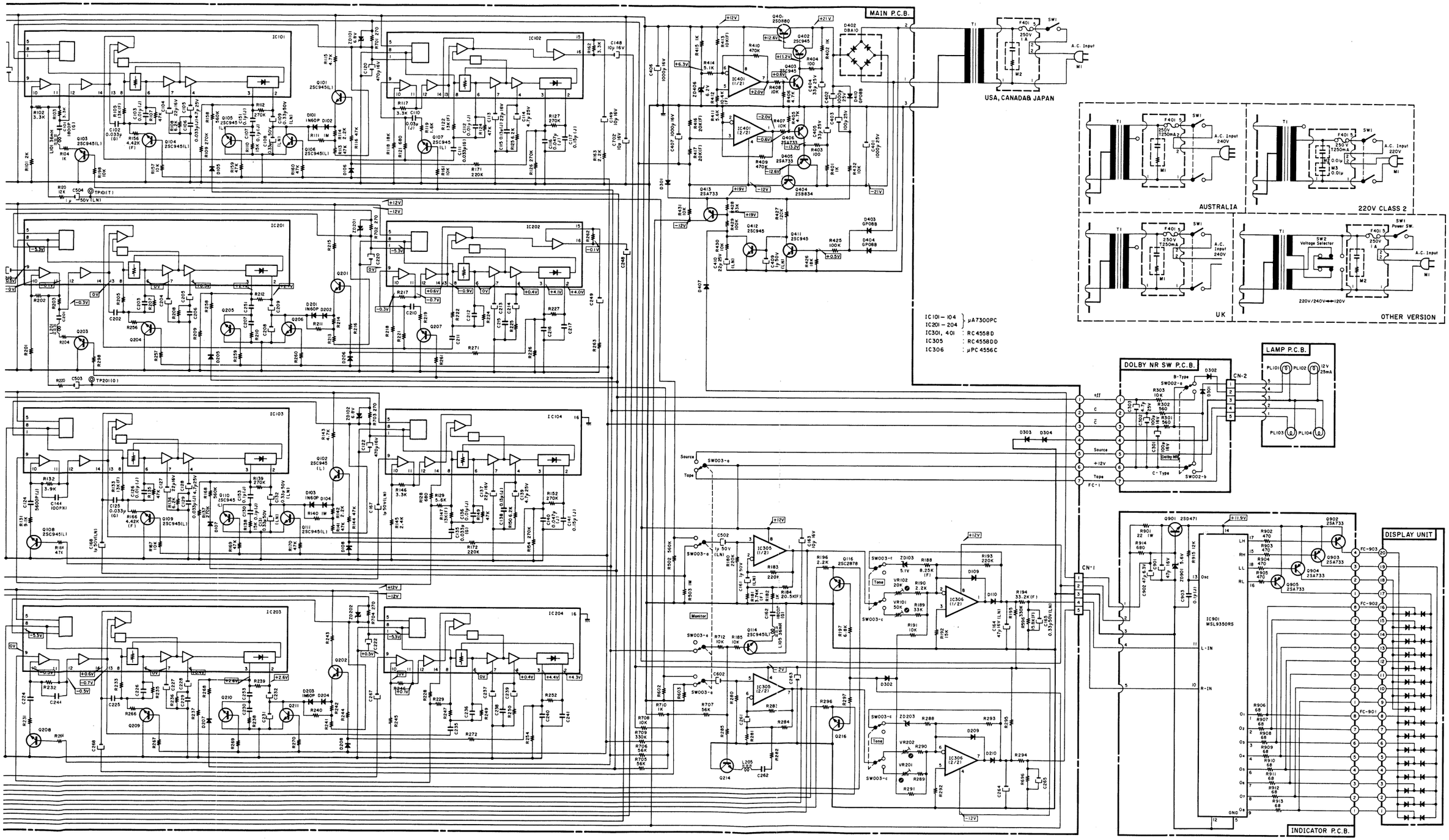
MAIN P.C.
IC101
IC102
IC103
IC104
IC201
IC202
IC203
IC204
IC401 (1/2)
IC305 (1/2)
IC306 (1/2)
IC305 (2/2)
IC401 (2/2)
IC101 – 104 : μA7300PC
IC201 – 204 : RC4558D
IC301, 401 : RC4558D
IC305 : RC4558DD
IC306 : μPC4556C
USA, CANADA& JAPAN
AUSTRALIA
220V CLASS 2
UK
OTHER VERSION
DOLBY NR SW P.C.B.
LAMP P.C.B.
DISPLAY UNIT
INDICATOR P.C.B.
IC901 MSL9350RS
CN-1
CN-2
FC-1
FC-901
FC-902
FC-903
B-Type
C-Type
Source
Tape
Monitor
Tone
Voltage Selector
Power SW.
A.C. Input
220V/240V⇔120V

Fig. 10.4

11. SPECIFICATIONS

Power Source	100, 120, 120/220-240, 220 or 240 V AC 50/60 Hz (according to country of sale)
Power Consumption	27 W max.
Noise Reduction Principle	Sliding Band
Number of Channels	4 (to provide simultaneous record/playback)
Noise Reduction B-Type NR	10 dB (above 2 kHz)
C-Type NR	Approx. 18 dB (1 kHz) Approx. 20 dB (2—8 kHz)
Frequency Response	20 Hz—20 kHz ±1 dB
Total Harmonic Distortion	Less than 0.1% (at 400 Hz, reference level 0 dB)
Encoder Input	45 mV 50 k ohms (Line Input)
Output	270 mV 2.2 k ohms (to Tape Deck's Line Input)
Decoder Input	45 mV 50 k ohms (from Tape Deck's Line Output)
Output	600 mV 2.2 k ohms (Line Output)
Dimensions	482(W) x 71.5(H) x 268(D) mm 19(W) x 2-13/16(H) x 10-35/64(D) inches
Approximate Weight	5.5 kg 12 lb. 2 oz

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